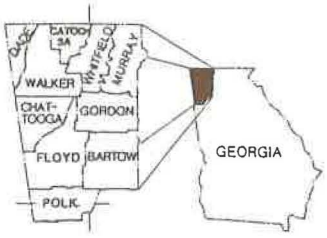
CERAMIC AND STRUCTURAL CLAYS AND SHALES OF FLOYD COUNTY, GEORGIA

BRUCE J. O'CONNOR



DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION
GEORGIA GEOLOGIC SURVEY

INFORMATION CIRCULAR 68

COVER PHOTO: Floyd Shale (Mississippian) and clay at the former Griffin Pipe Products Co. clay pits (Smith Creek mine) approximately 5 miles west of Rome, near the Central of Georgia Railroad south of Huffaker Rd. (1 1/4 miles north of Ga. Hw. 20). This material is extensively used in the manufacture of brick and tile.
(See location numbers Fl.31S-10, Fl.46-2, and Fl.57-11 for tests on samples from this general area.)

CERAMIC AND STRUCTURAL CLAYS AND SHALES OF FLOYD COUNTY, GEORGIA

By

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Information Circular 68

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TABLE OF CONTENTS

LIST OF ILLUSTRATIONS

LIST OF TABLES

INTRODUCTION

This report presents a compilation of all available published and unpublished ceramic firing tests and related analytical data on samples from Floyd County, Georgia. It provides information on mined and/or undeveloped clays, shales and related materials; and is intended for use by geologists, engineers and members of the general public. The report should aid in the exploration for deposits of ceramic raw material with economic potential for future development. This information may also be of use to those who wish to obtain information on the potential use of particular deposits at specific locations.

Tests by the U.S. Bureau of Mines, subsequently referred to as USBM, were performed by the Norris Metallurgy Research Laboratory, Norris, Tennessee and the Tuscaloosa Research Center, Tuscaloosa, Alabama under cooperative agreements with the Georgia Geologic Survey and its predecessors (i.e., the Earth and Water Division of the Ga. Department of Natural Resources; the Department of Mines, Mining and Geology; and the Geological Survey of Georgia). Many of the firing tests were performed on samples collected by former staff members of the Georgia Geologic Survey (and its predecessors) during several uncompleted and unpublished studies. These include work by Bentley (1964), Smith (1968?) and Tadkod (1980). Additional unpublished data presented in this compilation include work by TVA (see Butts and Gildersleeve, 1948, p. 124 and 125). Published data include studies by the following authors: Spencer (1893, p. 217 to 287; chemical analyses only), Veatch (1909, p. 272 to 388), Smith (1931, p. 241 to 276), and Butts and Gildersleeve (1948, p. 124 and 125).

Regardless of the source, all of the ceramic firing testing data presented in this report are based on laboratory tests that are preliminary in nature and will not suffice for plant or process design. They do not preclude the use of the materials in mixes (Liles and Heystek, 1977, p. 5).

ACKNOWLEDGEMENTS

The author gratefully acknowledges the help of many individuals during the preparation of this report and the work of many who contributed to the earlier, unpublished studies included here. The cooperative work of the U.S. Bureau of Mines forms the main data base of this study. During the last several years Robert D. Thomson, Chief of the Eastern Field Operations Center, Pittsburgh, Pennsylvania, was responsible for administering the funding of costs incurred by the USBM. Others in that office who helped coordinate the program were Charles T. Chislaghi and Bradford B. Williams. Since 1966 M.E. Tyrrell, H. Heystek, and A.V. Petty, Ceramic Engineers, and Kenneth J. Liles, Research Chemist, planned and supervised the test work done at the USBM Tuscaloosa Research Center in Tuscaloosa, Alabama. Prior to 1966 this test work was supervised by ceramists H. Wilson, G.S. Skinner, T.A. Klinefelter, H.P. Hamlin and M.V. Denny at the former Norris Metallurgy Research Laboratory in Norris, Tennessee. Tests by the Tennessee Valley Authority were conducted under the supervision of H.S. Rankin and M.K. Banks at the Mineral Research Laboratory on the campus of North Carolina State College, Asheville, North Carolina, using samples collected by S.D. Broadhurst. Additional tests were conducted by professors W.C. Hansard, L. Mitchell, and J.F. Benzel at the Department of Ceramic Engineering, Georgia Institute of Technology, Atlanta, Georgia. The majority of the unpublished tests were performed on samples collected by former staff geologists of the Georgia Geologic Survey, predominantly by J.W. Smith, A.S. Furcron, R.D. Bentley, N.K. Olsen, D. Ray, M.A. Tadkod, and G. Peyton, assisted by C.W. Cressler of the U.S. Geological Survey. N.K. Olsen and C.W. Cressler also have

provided the author with valuable advice and suggestions regarding sample locations and past studies. The advice and encouragement of my colleagues on the staff of the Georgia Geologic Survey are greatly appreciated. However, the contents of this report and any errors of omission or commission therein are the sole responsibility of the author.

LOCATION OF STUDY AREA

Floyd County is located at the southwestern corner of the Valley and Ridge province of northwest Georgia (Fig. 1). Four companies are currently mining clay and shale in the county, and numerous operations have been active here in the past (Tables 1 and 2). The most abundant ceramic raw materials in the county are the shales and residual clays derived from the Floyd Shale and the Conasauga Group; however, other units such as the Rome, Red Mountain, Pennington and Gizzard Formations, as well as residual clays of the Knox Group, are locally well developed. The general nature of these and other geologic units which occur in the county are summarized on Table 3.

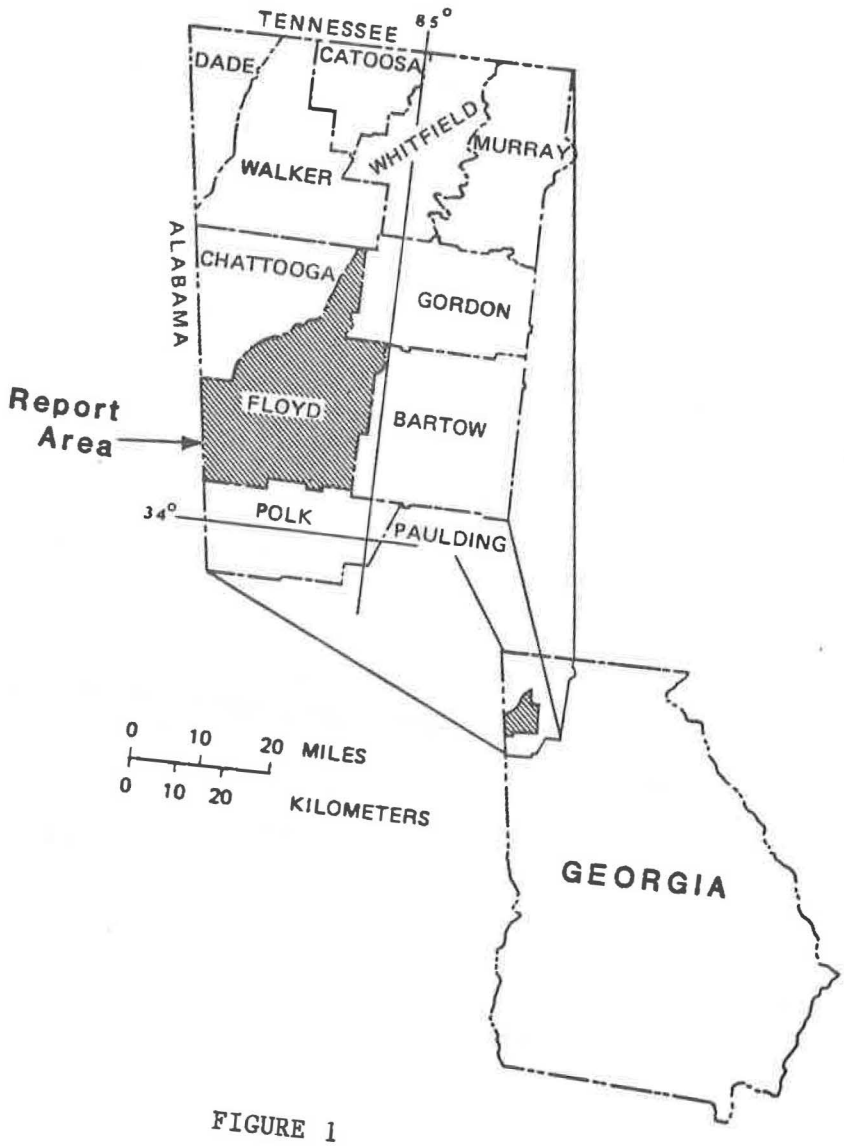


FIGURE 1

LOCATION OF FLOYD COUNTY REPORT AREA

(after Cressler, and others, 1976)

TABLE 1

Active Clay and Shale Mines and Pits in Floyd County, Georgia*

COMPANY CONTACT	LOCATION OF MINE, PIT OR QUARRY	USE(S) GEOLOGIC AGE-FORMATION
Bickerstaff Clay Products Co., Inc. P. O. Box 1178 Columbus, GA 31993 R.E. Matheny Vice President, Production (205) 291-0930	Neill pit: 3-1/2 miles west of Rome, on south side of Huffaker Rd., west of Woods Rd., north and south of Central of Ga. RR., 2 miles north of Ga. Hwy. 20 (Permit #192)	Ceramic tile and brick. Mississippian-Floyd Shale.
Florida Tile Industries, Inc. (Divn. of Sikes Corp) Shannon Plant, P.O. Box 962 Shannon, GA 30172 John Smith Plant Manager (404) 232-5181 or: P. O. 447 One Sikes Blvd. Lakeland, FL 33802 Warren E. Clegg, Exec. V.P. (813) 683-5431	Possum Trot mine: 3 miles northwest of Rome, 1/2 mile north of Central of Ga. RR., and Huffaker Rd. (Permit #714) Smith Creek mine: approximately 5 miles west of Rome, along Central of Ga. RR., 1-1/4 miles north of Ga. Hwy. 20, south of Huffaker Rd., west of Bickerstaff's Neill pit. (Permit #736 - formerly operated by Griffin Pipe Products Co. of Milledgeville, Permit #052)	Ceramic tile. Mississippian-Floyd Shale.
General Shale Products Corp. P. O. 3547 Johnson City, TN 37602 Walker Banyas Vice President, Real Estate (615) 282-4661 Billy Cantrell Mining Superintendent (404) 799-0491	Martin pit: 5 miles west of Rome city limits on south side of Southern RR., south of Ga. Hwy. 20, east of Ga. Kraft paper mill. (Permit # 014-formerly operated by Chattahoochee Brick Co. of Atlanta)	Brick. Cambrian-Conasauga Group Shale.
Jenkins Brick Co. 2620 Fisher Ave., NW. P. O. 39188 Atlanta, GA 30318 (404) 794-4491 or: P.O.Box 91, Montgomery, AL 36101 Jim Shull, V.P. Production (205) 834-2210	Lavender pit: about 3 miles west of Rome, south side of Huffaker Rd., just east of Bickerstaff's Neill pit, along Central of Ga. RR. (Permit #567)	Brick. Mississippian-Floyd Shale.

* After Kline and O'Connor, 1981, p. 11.

TABLE 2

Summary of 20th Century Clay and Shale Mines and Companies in Floyd County, Georgia

Atlanta Brick and Tile Co. (1892?), Rome: Common brick (Furcron, 1958, p. 5).

Berry School Brick Plant (c. 1930), Rome pits: Common brick from Floyd Shale. Purchased from Romega Clay Products Co., c. 1930 (Smith, 1931, No. 5, p. 75; Butts & Gildersleeve, 1958, No. 82). Ceramic test: Fl. 31S-5 a and b.

*Bickerstaff Clay Products Co., Inc. (Columbus, 1970), Rome pits: Brick made from Floyd Shale blended with other clay. Ceramic test: Fl. 77-1 and 80-2. 59 acres permitted.

*Chattahoochee Brick Co. (Atlanta, 1885), Rome pits: Brick made from Floyd Shale blended with other clays. Ceramic test: Fl. 31S-11 and Fl. 57-1 (Smith, 1931, No. 11, p. 94; Furcron, 1958, p. 5). (Purchased from B. M. Hood Co. ?) 14 acres permitted.

Crucial Fire Brick Company (1907), Rome plant and pits: Fire brick from bauxite and alluvial clays. Sold to Romega Clay Products Co. before 1929 (Veatch, 1909, p. 422; Smith, 1931, No. 5, p. 75).

W. S. Dickey Clay Mfg. Co. (1915), Rome plant and pits: Sewer pipe from various blends of Floyd Shale and clay. Purchased from Morrison and Trammel Brick Co., 1915, closed c. 1928? (Smith, 1931, No. 6, p. 83). Ceramic test: Fl. 31S-6.

Dixie Brick Co. (Columbus, 1957?), Rome pits: Common brick (Furcron, 1958, p. 5).

Florida Tile Co., Sikes Corp. (Florida, 1980), Shannon plant and Possum Trot Mine pit (also own former pits of Griffin Pipe Products Co.): Ceramic tile from Floyd Shale. 85 acres permitted.

Griffin Pipe Products Co. (Milledgeville, 1908), Rome pits: Sewer pipe, flue lining, fire brick and drain tile from Floyd Shale blended with other clays at Milledgeville plant, Baldwin County, Ga. Purchased from Oconee Clay Products Co. (?) closed 1980. 76 acres permitted. Ceramic test: Fl. 80-4a to d.

B. Mifflin Hood Co. (1925), Rome plant and pits: Roofing tile from Conasauga Group shales blended with alluvial clay. Purchased from Rome Brick Co., 1925. Ceramic test: Fl. 31S-18a and b (Smith, 1931, No. 18, p. 112).

*Jenkins Brick Co., Atlanta Brick and Tile Division, (Alabama, 1892, Rome pits: Brick from Floyd Shale. 43 acres permitted.

TABLE 2. Summary of 20th Century Clay and Shale Mines and Companies in Floyd County, Georgia (continued)

Morrison & Trammel Brick Co (1906), Rome plant and pits: Building brick. Sold to W. S. Dickey in 1915. Ceramic test: Fl. 09V-8 alluvial clay (Veatch, 1909, p. 324; Smith, 1931, No. 6, p. 83).

Oconee Clay and Shale Products Co. (Milledgeville, 1929), Rome, Coosa and Bone pits: Structural and drain tile from Floyd Shale and clay blended with other clays at Milledgeville plant, Baldwin County, Ga. (Smith, 1931, No. 10, p. 93; Butts and Gildersleeve, 1948, No. 81; Furcron, 1958, p. 5). Sold to Griffin Pipe ? Ceramic test: Fl. 31S-8; 31S-10; 57-1 and 57-12.

Rome Brick Company (1895), Rome plant and pits: Common brick. Sold to B. M. Hood Co., 1925. Ceramic test: Fl. 31S-18 (Veatch, 1909, p. 325; Butts and Gildersleeve, 1948, No. 83?; Smith, 1931, No. 18, p. 112; Furcron, 1958, p. 5).

Romega Clay Products Co. (prior to 1929), Berry School plant and pits (Rome): Common brick and structural tile from Floyd Shale and residual clay. Acquired from Crucial (Fire) Brick Co., before 1919; sold to Berry School c. 1930 (Smith, 1931, No. 5, p. 75).

Stevens, Inc. (Stevens Pottery), Rome pits (Dean property): Sewer pipe from Floyd Shale shipped to Stevens Pottery (Baldwin County, Ga.) and blended with other clays several years before 1926 (Smith, 1931, p. 84).

NOTE:

The majority of the information for the companies listed above was taken from the Mining Directories (Circular 2, 1st to 18th editions) published by the Georgia Geologic Survey and its predecessors at irregular intervals since 1937. Some additional information came from the "Georgia Surface Mining and Land Reclamation Activities" published annually since 1969 by the Georgia Surface Mined Land Reclamation Program (Environmental Protection Division, Ga. Dept. of Natural Resources). Additional sources of information were found in the references cited at the end of each entry. Uncertainty in the dates is due to incomplete records in the Survey's files.

* Active pit.

TABLE 3

Generalized Summary of Stratigraphic Units in Floyd County, Northwest Georgia

CHRONOSTRATIGRAPHIC UNIT	STRATIGRAPHIC UNITS - THICKNESS AND ROCK TYPES 1/
Quaternary (and Tertiary?)	* Various unnamed bodies of alluvial, colluvial and residual material. Largely clay and sand, but also, locally gravel and breccia.
Pennsylvanian	Gizzard Formation (or Group or Member) or Lookout Sandstone (or Formation) or Pottsville Formation - gray to tan shale, with interbedded siltstone, sandstone, coal and fire clay. Includes: Signal Point Member (or Shale) - Approx. 360 ft., shale with some coal; Warren Point Member (or Sandstone) - Approx. 140 ft., conglomeratic sandstone with minor coal; and Raccoon Mtn. Member (or Formation) - Approx. 175 ft., shale with coal.
Mississippian	Pennington Formation (or Shale) - Approx. 100-300 ft., gray, green and red shale. Sandstone present in middle. Bangor Limestone - Approx. 300-480 ft., fine- to coarse-grained gray limestone with interbedded shale at top. ** Floyd Shale - Approx. 100-2000 ft., silt and clay with some sandstone; limestone present at base. Approximate age-equivalent to Tuscambia Limestone and Monteagle Limestone. Hartselle Formation (or Member or Sandstone) - Approx. 50-300 ft., thin- to thick-bedded sandstone. Monteagle Limestone - Approx. 250 ft. Includes: Golconda Formation (or Limestone) - Approx. 15-20 ft., green fissile shale containing some thin limestone; Gasper Limestone - Approx. 150 ft., gray, non-cherty limestone; and Ste. Genevieve Limestone - Approx. 245 ft., gray, limestone. Tuscumbia Limestone - Approx. 125 ft. Includes: St. Louis Limestone - Approx. 125 ft., gray, very cherty limestone. Fort Payne Formation (or Chert) - Approx. 10-125 ft., thin- to thick-bedded chert and cherty limestone. Locally includes: *Lavender Shale Member - Approx. 0-100 ft., shale, massive mudstone and impure limestone.

TABLE 3

Generalized Summary of Stratigraphic Units in Floyd County, Northwest Georgia (continued)

CHRONOSTRATIGRAPHIC UNIT	STRATIGRAPHIC UNITS - THICKNESS AND ROCK TYPES 1/
Devonian	Chattanooga Shale - Approx. 5-10 ft., carbonaceous, fissile black shale. Armuchee Chert - Approx. 50-150 ft., thin- to thick-bedded chert.
Silurian	Red Mountain Formation (formerly Rockwood Formation) - Approx. 600-1200 ft., sandstone, red and green shale, with conglomerate, limestone and local hematitic iron ore.
Ordovician	Chickamauga Group (or Limestone) - Approx. 400 ft., dominantly limestones with some dolostone and lesser shale, claystone, siltstone, sandstone, anmd bentonite clay horizons. Equivalent, in part, to the Moccasin Limestone and Bays Formation and to the Rockmart Slate and Lenoir Limestone. Includes: Maysville Formation and Trenton Limestone; Lowville-Moccasin Limestone; Lebanon Limestone; and Murfreesboro Limestone.
Cambrian-Ordovician	(*)Knox Group - Approx. 2000-4000 ft., dominantly cherty dolostone, minor limestone. Includes: Newala Limestone - Approx. 300 ft., limestone and dolostone; Longview Limestone - Approx. 350 ft.; Chepultepec Dolomite - Approx. 800 ft.; and Copper Ridge Dolomite - Approx. 2500 ft.

TABLE 3

Generalized Summary of Stratigraphic Units in Floyd County, Northwest Georgia (continued)

CHRONOSTRATIGRAPHIC UNIT	STRATIGRAPHIC UNITS - THICKNESS AND ROCK TYPES 1/
Cambrian	** Conasauga Group (or Formation) - Approx. 1500-2000 ft., predominantly shale and limestone with minor sandstone. Includes: "Upper Unit" = Nolichucky Shale - and Maryville Limestone? - Approx. 400-1600 ft.; "Middle Unit" = Rutledge Limestone and Rogersville Shale? - Approx. 200-400 ft.; and "Lower Unit" = Pumpkin Valley Shale and Honaker Dolomite? - Approx. 300-500 ft. * Rome Formation - Approx. 500-1000 ft., shale, and interbedded sandstone, siltstone and quartzite. Shady Dolomite (or Dolostone) - Approx. 30-100 ft., cherty gray dolomite limestone with minor shale. = "Beaver Limestone" of former usage.

NOTES:

* = Some ceramic firing tests have been made on shales and clays of this unit.
(*) = Same as the above, but for residual clays only.
** = Numerous firing tests have been made on this unit.
1/ Descriptions based on data in Bergenback and others, 1980; Butts and Gildersleeve, 1948; Chowns, 1972, 1977; Chowns and McKinney, 1980; Crawford, 1983; Cressler 1963, 1964a and b, 1970, 1974; Cressler and others, 1979; Croft, 1964; Georgia Geologic Survey, 1976; Gillespie and Crawford, in press; Thomas and Cramer, 1979.

EXPLANATION OF KEY TERMS ON THE CERAMIC TEST AND ANALYSES FORMS

The test data and analyses which are presented here were compiled on a set of standardized forms (Ceramic Tests and Analyses) in the most concise manner consistent with the various laboratories represented. These forms are modified in large part after those used by the Pennsylvania Geological Survey (e.g., O'Neill and Barnes, 1979, 1981).

It should be noted that, although the great majority of these tests were performed by the USBM, it was decided not to reproduce their data forms directly for several reasons. First, the USBM forms contain several entries which are not essential to this project (e.g., Date received) or do not make the most efficient use of space. Second, the USBM forms have been changed several times over the span of decades covered by the present compilation. Finally, investigators from other laboratories have reported parameters which were not measured by the USBM.

The paragraphs which follow briefly describe, in alphabetical order, the more critical entries on the forms, the nature of the information included and, where possible, the various factors and implications to be considered in their interpretation. Many of the particular comments here are based on descriptive information published in the following sources. Tests by Georgia Geologic Survey authors are described in Veatch (1909, p. 50 to 64) and in Smith (1931, p. 19 to 25), while the particulars of the USBM studies are given in Klinefelter and Hamlin (1957, especially p. 5 to 41) and in Liles and Heystek (1977, especially p. 2 to 16). The discussions which follow are not intended to be exhaustive but are merely meant to remind the reader,

and potential user, of the key aspects of the information presented. Various technical texts and reports should be consulted for more detailed information (e.g., Clews, 1969; Grimshaw, 1972; Jones and Beard, 1972; Norton, 1942; Patterson and Murray, 1983). The abbreviations used on these test forms are defined in Table 4.

1. Absorption (%)

The absorption is a measure of the amount of water absorbed by open pores in the fired specimen and is given as a percentage of the specimen's dry weight. For slow firing tests, it is measured on fired specimens which have been boiled in water for 2 to 5 hours and then kept immersed in the water for up to 24 hours while cooling (Smith, 1931, p. 22; Klinefelter and Hamlin, 1957, p. 27-28; Liles and Heystek, 1977, p. 3). For the quick firing tests, however, the specimens are not boiled but only cooled and then immersed in water for 24 hours (Liles and Heystek, 1977, p. 4).

The absorption gives an indication of the amount of moisture which may be absorbed and subject to destructive freezing in outdoor structures. Less than 22% absorption is considered promising for slow-fired materials.

2. Appr. Por. (%) - Apparent Porosity, Percent

The apparent porosity is a measure of the amount of open pore space in the fired sample, relative to its bulk volume, and is expressed as a percent. As in the case of absorption values, it is based on the weight and volume of the specimen which has been boiled in water for 2 to 5 hours and then kept immersed in water for several hours as it cools (Klinefelter and Hamlin, 1957, p. 27 to 28; Liles and Heystek,

TABLE 4

Abbreviations for Terms on the Ceramic Firing Test Forms

ABBREVIATIONS

Appr. Por. = Apparent Porosity
App. Sp. Gr. = Apparent Specific Gravity

Btw. = Bartow County

°C = Degrees Celsius
Ct. = Catoosa County
Cht. = Chattooga County

Dd. = Dade County
Dist. = District
DTA = Differential Thermal Analysis

E. = East

°F = Degrees Fahrenheit
Fl. = Floyd County

g/cm^3 = Grams per cubic centimeter
Gdn. = Gordon County

Lab. & No. = Laboratory (name) and number (assigned in laboratory)
Lat. = Latitude
LOI = Loss on Ignition
Long. = Longitude
lb/in^2 = Pounds per square inch
lb/ft^3 = Pounds per cubic foot

Mry. = Murray County

N. = North
NE. = Northeast
NW. = Northwest

org. = Organic

Plk. = Polk County

S. = South
SE. = Southeast
SW. = Southwest
Sec. = Section

Table 4. Abbreviations for Terms on the Ceramic Firing Test Forms (continued)

7 1/2' topo. quad. = 7 and 1/2 minute topographic quadrangle

Temp. = Temperature
TVA = Tennessee Valley Authority

USBM = U.S. Bureau of Mines
USGS = U.S. Geological Survey

W. = West
Wkr. = Walker County
Wf. = Whitfield County

XRD = X-ray diffraction

1977, p. 3). The apparent porosity is an indication of the relative resistance to damage during freezing and thawing. Less than 20% apparent porosity is considered promising for slow-fired materials (O'Neill and Barnes, 1979, p. 14, Fig. 4).

3. App. Sp. Gr. - Apparent Specific Gravity

As reported in earlier USBM studies, the apparent specific gravity is a measure of the specific gravity of that portion of the test specimen that is impervious to water. This is determined by boiling the sample in water for 2 hours and soaking it in water overnight or 24 hours (Klinefelter and Hamlin, 1957, p. 27 to 28). These data were replaced by bulk density and apparent porosity measurements after the USBM moved its laboratories from Norris, Tennessee to Tuscaloosa, Alabama in 1965.

4. Bloating

Bloating is the term given to the process in which clay or shale fragments expand (commonly two or more times their original volume) during rapid firing. It results from the entrapment of gases which are released from the minerals during firing but which do not escape from the body of the host fragment due to the viscosity of the host at that temperature. Bloating is a desirable and essential property for the production of expanded lightweight aggregate where an artificial pumice or scoria is produced. Expanded lightweight aggregate has the advantages of light weight and high strength compared to conventional crushed stone aggregate. Bloating is not desirable, however, in making other structural clay products such as brick, tile and sewer pipe where the dimensional characteristics must be carefully controlled. In these cases bloating is extremely deleterious since it leads to variable and uncontrollable warping, expansion and general disruption of the fired clay body (Klinefelter and Hamlin, 1957, p. 39-41).

5. Bloating Test (or Quick Firing Test)

The Bloating Test refers to the process of rapidly firing (or "burning") the raw sample in a pre-heated furnace or kiln to determine its bloating characteristics for possible use as a lightweight aggregate. Although specific details of the different laboratory methods vary, all use several fragments of the dried clay or shale placed in a refractory plaque (or "boat") which in turn is placed in the pre-heated furnace for 15 minutes (Klinefelter and Hamlin, 1957, p. 41; Liles and Heystek, 1977, p. 4).

6. Bulk Density (or Bulk Dens.)

The bulk density is a measure of the overall density of the fired specimen based on its dry weight divided by its volume (including pores). Determinations are the same for slow firing and quick firing test samples, although for the latter the results are given in pounds per cubic inch as well as grams per cubic centimeter units (Klinefelter and Hamlin, 1957, p. 27 to 28 and 41; Liles and Heystek, 1977, p. 3 and 4). If quick-fired material yields a bulk density of less than 62.4 lb/ft3 (or if the material floats in water), it is considered promising for lightweight aggregate (K. Liles, oral communication, 1984).

7. Color

The color of the unfired material, unless otherwise stated, represents the crushed and ground clay or shale. In most cases this is given for descriptive purposes only since it is generally of no practical importance for ceramic applications (only the fired color is significant). Here only broad descriptive terms such as light-brown, cream, gray, tan, etc. are used. Fired colors are more critical and therefore more specific descriptive terms and phrases are used (Klinefelter and Hamlin, 1957, p. 18 and 19). In many cases the Munsell color is given for a precise description (see discussion below).

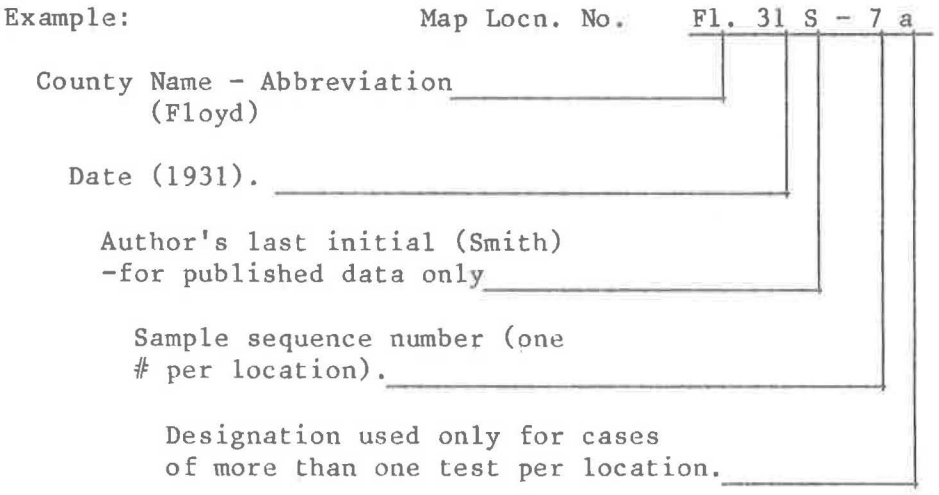
8. Color (Munsell)

This is a system of color classification based on hue, value (or brightness) and chroma (or purity) as applied to the fired samples in this compilation. It was used by Smith (1931, p. 23-25) and by the

USBM since the early 1970's (Liles and Heystek, 1977, p. 3; Liles, oral communication, 1982). In all other cases the fired color was estimated visually.

9. Compilation Map Location No.

This number or code was assigned by the author to provide a systematic designation to be used in plotting sample locations on the base maps as shown by the typical example below.



The map location number Fl. 31S-7a is derived from the county name (e.g., Fl. for Floyd County), the year the tests were performed (e.g., 31 for 1931) plus the last initial of the author for major published sources (e.g., S for Smith), followed by a sequence number assigned in chronological order or sequential order for published data. (The only exceptions to this are the tests reported in Smith, 1931, wherein the sequence number of the present report is the same as the "Map location No." of Smith.) Each map location number represents a

specific location, or area, sampled at a particular time. In cases where several separate samples were collected from a relatively restricted area, such as an individual property, such samples are designated a, b, c, etc. Different map location numbers have been assigned to samples which were collected from the same general locality, such as a pit or quarry, but which were collected by different investigators at different times.

10. Cone

Standard pyrometric cones, or cones, are a pyrometric measure of firing temperature and time in the kiln. They are small, three-sided pyramids made of ceramic materials compounded in a series, so as to soften or deform in progression with increasing temperature and/or time of heating. Thus, they do not measure a specific temperature, but rather the combined effect of temperature, time, and other conditions of the firing treatment. The entire series of cones ranges from about 1112°F (600°C) to about 3632°F (2000°C) with an average interval of about 20°C between cones for a constant, slow rate of heating (Klinefelter and Hamlin, 1957, p. 29). For the past several decades the use of these cones has been limited to the Pyrometric Cone Equivalent (PCE) test (Liles and Heystek, 1977, p. 16). However, all of the ceramic firing tests reported by Veatch (1909) and Smith (1931) as well as some of the earliest USBM tests report firing conditions in terms of the standard cone numbers.

11. Drying Shrinkage

The drying shrinkage is a measure of the relative amount of shrinkage (in percent) which the tempered and molded material undergoes

upon drying. Although there are a variety of ways by which this can be measured, in this report the shrinkage values represent the percent linear shrinkage based on the linear distance measured between two reference marks or lines imprinted on the plastic specimen before drying. Even though the methods have varied in detail, the drying is usually accomplished in two stages: first, by air drying at room temperature (usually for 24 hours) and second, by drying in an oven followed by cooling to room temperature in a desiccator (Klinefelter and Hamlin, 1957, p. 30-31; Liles and Heystek, 1977, p. 3). In most cases the heating was at 212°F (100°C) for 24 hours; however, studies by Smith (1931, p. 20 and 21) employed 167°F (75°C) for 5 hours followed by 230°F (110°C) for 3 hours.

12. Dry Strength

The dry strength (or green strength) is a measure of the apparent strength of the clay or shale after it has been molded and dried. Unless otherwise indicated, it represents the tranverse, or crossbreaking, strength as opposed to either tensile strength or compressive strength. For the great majority of cases only the approximate dry strength is indicated as determined by visual inspection, using such terms as low, fair, good, or high (Klinefelter and Hamlin, 1957, p. 32-33; Liles and Heystek, 1977, p. 2). Smith (1931, p. 12-13) reports a quantitative measurement of this strength using the modulus of rupture (MOR) expressed in units of pounds per square inch (psi).

13. Extrusion Test

More extensive tests are sometimes made on clays and shales which

show good plasticity and long firing range in the preliminary test. In the Extrusion Test several bars are formed using a de-airing extrusion machine (i.e., one which operates with a vacuum to remove all possible air pockets). These bars are fired and tested for shrinkage, strength (modulus of rupture) and water saturation coefficient (Liles and Heystek, 1977, p. 8).

14. Firing Range

The term firing range indicates the temperature interval over which the material shows favorable firing characteristics. For slow-fired materials such desirable qualities include: a) good strength or hardness; b) good color; c) low shrinkage; d) low absorption; and e) low porosity. For quick-fired materials these include: a) good pore structure; b) low absorption; and c) low bulk density. For slow-firing and quick-firing tests the firing range should be at least 100°F (55°C) to be considered promising (O'Neill and Barnes, 1979, p. 15-18).

15. Hardness

The hardness, as measured on fired materials, indicates the resistance to abrasion or scratching. It is designated either in verbal, descriptive terms or in numerical terms using Mohs' hardness (Liles and Heystek, 1977, p. 3). It is used as an indication of the strength of the fired materials. Smith (1931), however, measured the fired strength with the modulus of rupture.

16. Hardness (Mohs')

The hardness of fired specimens using the Mohs' scale of hardness

is currently used by the USBM as a numerical measure of the fired bodies' strength (Liles and Heystek, 1977, p. 3). The values correspond to the hardness of the following reference minerals:

Mohs' Hardness No.	Reference Minerals
1	Talc
2	Gypsum
3	Calcite
4	Fluorite
5	Apatite
6	Orthoclase
7	Quartz
8	Topaz
9	Corundum
10	Diamond

A Mohs' hardness greater than 3 is considered promising for slow-fired materials.

17. HCl Effervescence

The effervescence in HCl is visually determined as none, slight or high based on the reaction of 10 ml of concentrated hydrochloric acid added to a slurry of 10 grams powdered clay or shale (minus 20 mesh) in 100 ml of water (Klinefelter and Hamlin, 1957, p. 17; Liles and Heystek, 1977, p. 4). This test gives a general indication of the amount of calcium carbonate present in the sample. An appreciable effervescence could be an indication of potential problems with lime pops and/or frothing of slow-fired ceramic products.

18. Linear Shrinkage, (%)

The term linear shrinkage represents the relative shrinkage of the clay body after firing. In most cases it represents the percent total linear shrinkage from the plastic state and is based on measurements

between a pair of standard reference marks imprinted just after molding (Klinefelter and Hamlin, 1957, p. 30-32; Liles and Heystek, 1977, p. 3). (Also see the discussion under Drying Shrinkage.) Smith (1931, p. 22) gives the shrinkage relative to both the dry, or green, state (under the column headed Dry) as well as the plastic state (under the column headed Plastic). A total shrinkage of 10% or less is considered promising for slow-fired materials.

19. Modulus of Rupture (MOR)

The modulus of rupture is a measure of the strength of materials (for crossbreaking or transverse strength in this compilation) based on the breakage force, the distance over which the force was applied and the width and thickness of the sample. The MOR is expressed in psi units (pounds per square inch) for the limited MOR data reported here (determined by Smith, 1931, p. 21 and 23).

20. Mohs'

See Hardness (Mohs').

21. Molding Behavior

See Working Properties.

22. Munsell

See Color (Munsell).

23. "MW" face brick

"MW" stands for moderate weather conditions. This is a grade of brick suitable for use under conditions where a moderate, non-uniform

degree of frost action is probable (Klinefelter and Hamlin, 1957, p. 36 and 37; ASTM Annual Book of Standards, 1974). (Also see "SW" face brick.)

24. PCE - Pyrometric Cone Equivalent

The PCE test measures the relative refractoriness, or temperature resistance, of the clay or shale; it is indicated in terms of standard pyrometric cones. The value given is the number of the standard pyrometric cone which softens and sags (or falls) at the same temperature as a cone made from the clay or shale being studied. These tests are usually only made on refractory materials which show favorable potential in the preliminary slow firing tests (i.e., high absorption, low shrinkage, and light fired color). The results are usually given for the upper temperature range Cone 12 (1337°C; 2439°F) to Cone 42 (2015°C; 3659°F) where the temperature equivalents are based on a heating rate of 150°C (270°F) per hour. With increasing temperature resistance the sample is designated as either a low-duty, medium-duty, high-duty, or super-duty fire clay (Klinefelter and Hamlin, 1957, p. 29-30 and 57-58; Liles and Heystek, 1977, p. 16).

25. pH

The pH is a measure of the relative acidity or alkalinity with values ranging from 0 to 14. (A pH of 7 is neutral. Values greater than this are alkaline whereas those which are less than 7 are acid.) Most of the ceramic tests by the USBM presented here show pH values as determined on the crushed and powdered raw material (in a water slurry) prior to firing (Klinefelter and Hamlin, 1957, p. 28; Liles and Heystek, 1977, p. 4).

Strongly acid or alkaline pH values may give some indication of potential problems with efflorescence and scum due to water-soluble salts in the clay. Unfortunately, no simple and direct interpretation is possible from the pH data alone. The best method for determining these salts is through direct chemical analysis as described under Soluble Salts. (Also see Solu-Br.)

26. Plasticity

See Working Properties.

27. Porosity, Apparent

See App. Por.

28. Quick Firing

See Bloating Test.

29. Saturation Coefficient

The saturation coefficient is determined only for specimens which have undergone the more extensive Extrusion Test. It is determined by submerging the fired specimen in cool water for 24 hours, followed by submerging the specimen in boiling water for 5 hours. The saturation coefficient is found by dividing the percent of water absorbed after boiling into the percent of water absorbed after the 24-hour submergence (Liles and Heystek, 1977, p. 8).

30. Shrinkage

See Drying Shrinkage and Linear Shrinkage.

31. Slaking

See Working Properties.

32. Slow Firing Test

Slow Firing Test refers to the process of firing ("burning") the dried specimen in a laboratory furnace or kiln. Although specific details of the different laboratory methods vary, all specimens are started at room temperature and are slowly heated to the desired temperature over a specific interval of time.

The majority of the slow firing tests by the USBM reported here were made using 15-minute draw trials. In this method a set of molded and dried test specimens are slowly fired in the kiln or furnace. The temperature is gradually raised to 1800°F (982°C) over a period of 3 to 4 hours (to avoid disintegration of the specimen as the chemically combined water is released) and the temperature is held constant for about 15 minutes. One specimen is removed from the kiln (a draw trial) and the temperature is raised to the next level (usually in intervals of 100°F). At each interval the temperature is again held constant for a 15-minute soak and then one specimen is withdrawn. This process is repeated until the final temperature is achieved (usually 2300 or 2400°F; 1260 or 1316°C) - see Klinefelter and Hamlin (1957, p. 19 and 30). The disadvantage of this draw trial method is that it tends to underfire the specimens, compared to the industrial process, since they are soaked for a relatively short time and quickly cooled by removal from the kiln.

Since the early 1970's the USBM has abandoned the draw trials and has adopted a method which more closely resembles the conditions of

commercial manufacture. As described by Liles and Heystek (1977, p. 2 and 3), one of the test specimens is slowly fired, over 24 hours, to 1832°F (1000°C), where it is held for a one-hour soak. The kiln is then turned off, but the specimen remains in the kiln as it slowly cools. (This gives a much closer approximation of most commercial firing processes.) This is subsequently repeated, one specimen at a time, for successive 50°C intervals usually up to 2282°F (1250°C). Unfortunately, only a relatively small part of the current data set is represented by USBM tests using this newer method.

The firing test methods used by Smith (1931, p. 21 and 22) are somewhat intermediate to the two methods described above. First, the specimens were slowly fired from 200 to 1200°F (93 to 649°C) over a period of 11 hours. The temperature was subsequently increased at a rate of 200°F per hour for approximately 4 hours followed by 100°F per hour until final temperature conditions were reached. At these later stages firing conditions were monitored using standard pyrometric cones in the kiln. The maximum firing temperature was determined from observed pyrometric cone behavior. This temperature was based on the temperature equivalent to 2 cones below the desired final cone. The kiln temperature was then held constant until the desired cone soaked down. Test specimens were then removed from the kiln and allowed to cool. Smith's firings averaged about 17 hours in the kiln and all specimens were fired to cones 06, 04, 02, 1, 3 and 5 wherever possible. No specific information is available on the methods employed by Veatch (1909) or the unpublished data from TVA or Georgia Tech.

33. Solu-Br. (Solu-Bridge)

Solu-Bridge measurements were used in the 1950's and 60's by the

USBM as a measure of the soluble salts (e.g., calcium sulfate) in the unfired raw material which might cause scum and efflorescence on fired products. "The solubridge and pH readings show the higher alkali samples. Solubridge determinations give the water soluble part of the alkalis and readings above 1.5 indicate fairly high soluble salt content. Clays containing high alkalies have rather short maturing temperatures and require closer firing control. The alkalis also influence the color and lower the vitrification temperature." (H.P. Hamlin, written communication, 1957). In this method the pulverized clay or shale is boiled in water, left to stand overnight, and filtered. The content of soluble salts in the solution is then measured using the Solu-Bridge instrument readings applied to suitable calibration tables (Klinefelter and Hamlin, 1957, p. 28-29). These data are no longer collected because consistent and meaningful results are difficult to achieve.

34. Soluble Salts

Excessive water-soluble salts can cause problems with efflorescence or scum on fired clay products. (More than 3 to 4% calcium sulfate, and 1/2% magnesium or alkali sulfates are considered excessive.)

The most accurate determinative method is to boil the finely powdered sample in distilled water for 1/2 to 1 hour and let it soak overnight. The decanted solution is then analyzed for the soluble salts using standard chemical methods. The Solu-Bridge readings may also be used as a general measure of the soluble salts (Klinefelter and Hamlin, 1957, p. 28).

35. Strength

See Dry Strength and Modulus of Rupture.

36. "SW" face brick

"SW" stands for severe weather conditions. This is a grade of brick suitable for use under conditions where a high degree of frost action is probable (Klinefelter and Hamlin, 1957, p. 36 and 37, and theASTM Annual Book of Standards, 1974). (Also see "MW" face brick.)

37. Temp. °F (°C)

The temperature at which the material was fired (both slow and quick firing tests) is given in Fahrenheit (°F) followed by the Celsius (°C) conversion in parentheses. In cases where only pyrometric cone values are available, the approximate temperature is given on the form and is based on the table of temperature equivalents in Norton (1942, p. 756, Table 128) or in Veatch (1909, p. 57).

38. Water of Plasticity (%)

This is a measure of the amount of water (as weight percent relative to the dry material) required to temper the pulverized raw clay or shale into a plastic, workable consistency. This is not a precise measurement, being dependent upon the experience of the technician, the type of equipment used and the plasticity criteria. In most cases it represents the amount of water necessary for the material to be extruded into briquettes from a laboratory hydraulic ram press. In general, high water of plasticity values tends to correlate with a greater degree of workability, higher plasticity and finer grain size. Unfortunately, high values also correlate with a greater degree of shrinkage,

warping and cracking of the material upon drying. (See Klinefelter and Hamlin, 1957, p. 20-22; Liles and Heystek, 1977, p. 2.)

39. Working Properties (or Workability)

This area of working properties includes comments on the slaking, plasticity, and molding, or extruding behavior of the tempered material (Klinefelter and Hamlin, 1957, p. 5, 19-22 and 33-34). The term slaking refers to the disintegration of the dry material when immersed in water. It may range in time from less than a minute to weeks, but generally in the present report it is given only a relative designation such as rapid, slow, or with difficulty. Plasticity likewise is designated in a comparative manner in order of decreasing plasticity: plastic, fat (or sticky), semiplastic, short (or lean), semiflint and flint. Molding behavior is referred to as good, fair, or poor and is a general designation for the ease with which the material can be molded into test bars or briquettes.

These working properties are very imprecise and strongly dependent upon the judgement and experience of the operator. They do, however, give a general indication of how the material might respond to handling in the industrial process.

Ceramic Tests and Analyses of Clays and Shales in Floyd County, Georgia *

* The data presented in this report are based on laboratory tests that are preliminary in nature and will not suffice for plant or process design.

CERAMIC TESTS AND ANALYSES

Material Clay, bauxitic. Compilation Map Location No. F1.09V-1

County Floyd Sample Number -

Raw Properties: Lab & No. Ga. Geol. Survey.

Date Reported 1909 Ceramist O. Veatch, Ga. Geol. Survey.

Water of Plasticity - % Working Properties Very poor plasticity.

Color White or mottled. Drying Shrinkage 2 % Dry Strength (tensile) Low.

Slow Firing Tests:

Aprox. Temp. °F (°C)	Color	Hardness	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data:
2210 (1210) (Cone 4)	White	Soft	4.7	-	-	-
2534 (1390) (Cone 13)	White	Soft, friable	5.5	-	-	-
3362 (1850) (Cone 36)	White	Unfused	-	-	-	-

Remarks / Other Tests It "should be suitable for high grade fire brick. The only common fluxing impurity is a small percentage of iron." (Veatch, 1909, p. 266).

Preliminary Bloating (Quick Firing) Tests: Not determined.

Crushing Characteristics (unfired material) -

Particle Size - Retention Time -

Chemical & Mineralogical Data: Not determined.

Chemical Analysis		Mineralogy	
Oxide	Weight %	Mineral	volume %
SiO_2			
TiO_2		Quartz	
Al_2O_3		Feldspar	
Fe_2O_3		Carbonate	
FeO		Mica	
MnO		Chlorite-vermiculite	
MgO		Montmorillonite	
CaO		Others	
Na_2O			
K_2O			
P_2O_5			
S (total)		Total	
C (org.)			
CO_2			
H_2O^-			
H_2O^+			
Ignition loss			
Total			

Analyst _____ _____

Date _____ _____

Method _____ _____

Sample Location Data:

County Floyd. Land Lot 103, Sec. 3, Dist. 23.

7 1/2' topo quad. Shannon (cntr.). Lat. _____, Long. _____.

Field No. -, Collected by O. Veatch Date c.1909.

Sample Method Grab(?). Weathering/alteration Residual(?) clay.

Structural Attitude -

Stratigraphic Assignment Eocene(?) residual clay.

Sample Description & Comments Sample of soft, "lean" white or mottled bauxitic clay from an open pit 35 ft. or more deep at the "103" mine of the Republic Mining & Manufacturing Company, Hermitage District, 5 mi. NE. of Rome (Veatch, 1909, p. 265-266). (Also in Watson, 1904, p.66 and White and others, 1966, Plate 1.)

Compiled by B.J. O'Connor Date 11-29-82

CERAMIC TESTS AND ANALYSES

Material Bauxite (low grade). Compilation Map Location No. F1.09V-2

County Floyd Sample Number -

Raw Properties: Lab & No. Ga. Geol. Survey, #44.

Date Reported 1909. Ceramist O. Veatch, Ga. Geol. Survey.

Water of Plasticity - % Working Properties -

Color Iron-stained. Drying Shrinkage - % Dry Strength -

Slow Firing Tests:

Approx. Temp. °F (°C)	Color	Hardness	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data:
3362 (1850) (Cone 36)	-	Unfused	-	-	-	-

Remarks / Other Tests This material "would probably have to be calcined before it could be successfully burned." (Veatch, 1909, p. 266).

Preliminary Bloating (Quick Firing) Tests: Not determined.

Crushing Characteristics (unfired material) -

Particle Size - Retention Time -

Chemical & Mineralogical Data: ("kaolin" sample from same Land Lot, but exact location unknown)

Chemical Analysis

Oxide		Weight %
SiO_2		41.20
TiO_2		1.95
Al_2O_3		38.60
Fe_2O_3	(total)	1.45
FeO		
MnO		-
MgO		0.30
CaO		-
Na_2O		0.02
K_2O		0.09
P_2O_5		-
S	(total)	-
C	(org.)	-
CO_2		-
H_2O^-		0.35
H_2O^+		16.35
Ignition loss		-
Total		100.31

Mineralogy: Not determined.

Mineral	volume %
Quartz	
Feldspar	
Carbonate	
Mica	
Chlorite-vermiculite	
Montmorillonite	
Others	
Total	

Analyst (in Spencer, 1893, p. 281; and in Veatch, 1909, p. 266 and Appendix B, No. 44, p. 412-413.)

Date 1893.

Method Standard "wet".

Sample Location Data:

County Floyd. Land Lot 21 (N. 1/2). Sec. 3, Dist. 23.

7 1/2' topo quad. Shannon (NE. 1/4). Lat. , Long. .

Field No. -, Collected by Spencer and Veatch Date c.1893 and c.1909.

Sample Method Grab(?) Weathering/alteration Residual(?).

Structural Attitude -

Stratigraphic Assignment Eocene(?) residual clay.

Sample Description & Comments Sample of hard, iron-stained low grade bauxite collected by Veatch (1909, p. 266) from near the old Stockage Bank mine. The chemical analysis is from a white clay taken from this same Land Lot (Spencer, 1893, p. 281). (Also described in Watson, 1904, p. 68-69 and White and others, 1966, Plate 1.)

Compiled by B.J. O'Connor Date 11-29-82

CERAMIC TESTS AND ANALYSES

Material Clay, bauxitic. Compilation Map Location No. F1.09V-3

County Floyd. Sample Number -

Raw Properties: Lab & No. Ga. Geol. Survey.

Date Reported 1909 Ceramist O. Veatch, Ga. Geol. Survey.

Water of Plasticity - %Working Properties Poor plasticity, lean, granular.
Color Pinkish, mottled. Drying Shrinkage - % Dry Strength Low.

Slow Firing Tests:

Approx. Temp. °F (°C)	Color	Hardness	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data:
3362 (1850) (Cone 36)	-	Unfused	-	-	-	-

Remarks / Other Tests This "should be suitable for basic fire-brick," although it would have to be calcined first (Veatch, 1909, p. 266-267).

Preliminary Bloating (Quick Firing) Tests: Not determined.

Crushing Characteristics (unfired material) -

Particle Size - Retention Time -

Chemical & Mineralogical Data: (On similar clay from the Church Bank.)

Chemical Analysis

Oxide		Weight %
SiO_2		20.46
TiO_2		9.82
Al_2O_3		46.92
Fe_2O_3		
FeO	(total)	0.28
MnO		-
MgO		-
CaO		-
Na_2O		-
K_2O		-
P_2O_5		-
S	(total)	-
C	(org.)	-
CO_2		-
H_2O^-		0.34
H_2O^+		21.68
Ignition loss		-
Total		99.50

Mineralogy: Not determined.

Mineral	volume %
Quartz	
Feldspar	
Carbonate	
Mica	
Chlorite-vermiculite	
Montmorillonite	
Others	
Total	

Analyst T. L. Watson, Ga. Geol. Survey (1904, Bull. 11, p.65) on soft, structureless bauxitic clay matrix to the bauxite ore.

Date c.1904.

Method Standard "wet".

Sample Location Data:

County Floyd. Land Lot 61 (Watson, 1904, p. 61-63), Sec. 3, Dist. 23.

7 1/2' topo quad. Shannon (NE. 1/4). Lat. , Long. .

Field No. -, Collected by Watson and Veatch Date c. 1904 c. 1909

Sample Method Grab(?.) Weathering/alteration Residual(?) clay.

Structural Attitude -

Stratigraphic Assignment Eocene(?) residual clay.

Sample Description & Comments Sample from the Holland Hill mine, Hermitage District, collected by Veatch (1909, p. 266-267) who refers to white, lean and granular bauxitic clays from this and nearby mines: "The clays are soft, or pinkish, and mottled, poorly plastic, and have low air dried strength." The chemical analysis is on similar material from the nearby Church Bank mine (Watson, 1904, p. 65). (Also White and others, 1966, Pl 1.)

Compiled by B.J. O'Connor Date 11-29-82

CERAMIC TESTS AND ANALYSES

Material Clay, bauxitic. Compilation Map Location No. Fl.09V-4

County Floyd. Sample Number -

Raw Properties: Lab & No. Ga. Geol. Survey, #42.

Date Reported 1909 Ceramist O. Veatch, Ga. Geol. Survey.

Water of Plasticity 40 % Working Properties Very little plasticity. Slakes into small granules.

Color Faint pinkish to cream. Drying Shrinkage 5.4 % Dry Strength (tensile) 12 psi.

Remarks Specific Gravity: 2.45

Slow Firing Tests:

Approx. Temp. °F (°C)	Color	Hardness	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data: Remarks
2210 (1210) (Cone 4)	Pure white	Not steel hard	3.8	-	-	Cracked, very friable.
2390 (1310) (Cone 9)	Pure white	Not steel hard	9.5	-	-	Cracked, friable.
2462 (1350) (Cone 11)	White	-	-	-	-	Cracked to pieces.
2642 (1450) (Cone 16)	Slight cream	Steel hard, not vitrified	16.3	-	-	-
3362 (1850) (Cone 36)	-	Unfused	-	-	-	-

Remarks / Other Tests PCE: Higher than Cone 36. It is a very high grade refractory clay, but it would have to be calcined before firing because of its cracking (Veatch, 1909, p. 268).

Preliminary Bloating (Quick Firing) Tests: Not determined.

Crushing Characteristics (unfired material) -

Particle Size - Retention Time -

Chemical & Mineralogical Data:

Chemical Analysis

Oxide		Weight %
SiO_2		25.83
TiO_2		2.53
Al_2O_3		48.22
Fe_2O_3		0.85
FeO		-
MnO		0.00
MgO		0.18
CaO		0.00
Na_2O		0.15
K_2O		0.19
P_2O_5		0.00
S	(total)	0.00
C	(org.)	-
CO_2		-
H_2O^-		0.24
H_2O^+		-
Ignition loss		21.77
Total		99.96

Mineralogy: Not determined.

Mineral	volume %
Quartz	
Feldspar	
Carbonate	
Mica	
Chlorite-vermiculite	
Montmorillonite	
Others	
Total	

Analyst E. Everhart, Ga. Geol. Survey (in Veatch, 1909, p. 268; and Appendix B, p.412-413, No. 42 - erroneously listed as "Walters Mine").

Date c.1909

Method Standard "wet".

Sample Location Data:

County Floyd. Land Lot 147, Sec. 3, Dist. 23. (Watson, 1904, p.72-74)

7 1/2' topo quad. Shannon (SW. 1/4). Lat. , Long. .

Field No. -, Collected by O. Veatch Date c.1909.

Sample Method Grab(?) Weathering/alteration Residual(?) clay.

Structural Attitude -

Stratigraphic Assignment Eocene(?) residual clay.

Sample Description & Comments Sample from the south pit of the National Bauxite Company ("Watters Bank", Hermitage District) 5 mi. NE. of Rome, about 1 1/2 mi. E. of Berwin station, Southern RR. The clay ranges from cream and pink to highly colored with more or less disseminated bauxite. The sample is fine-grained, free of sand and bauxite pisolites, but tends to crumble into small angular lumps (Veatch, 1909, p. 267-269). This deposit also described by Watson (1904, p. 72-74) and White and others (1966, Pl. 1).

Compiled by B.J. O'Connor Date 11-29-82

CERAMIC TESTS AND ANALYSES

Material Clay (bauxitic?). Compilation Map Location No. Fl.09V-5

County Floyd. Sample Number -

Raw Properties: Lab & No. Ga. Geol.Survey, #43.

Date Reported 1909 Ceramist O. Veatch, Ga. Geol. Survey.

Water of Plasticity - % Working Properties Plasticity - fair.

Color White. Drying Shrinkage 3.5 % Dry Strength (tensile) Very low.

Slow Firing Tests:

Approx. Temp. °F (°C)	Color	Hardness	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data: Remarks
2210 (1210) (Cone 4)	White	Soft	6.6	-	-	Cracked.
2606 (1430) (Cone 15)	White	-	14.8	-	-	Cracked.

Remarks / Other Tests Possibly suitable for making refractory products, but it would have to be calcined first to prevent cracking.

Preliminary Bloating (Quick Firing) Tests: Not determined.

Crushing Characteristics (unfired material) -

Particle Size - Retention Time -

Chemical & Mineralogical Data:

Chemical Analysis

Oxide	Weight %
SiO_2	37.06
TiO_2	3.68
Al_2O_3	40.27
Fe_2O_3	1.57
FeO	-
MnO	-
MgO	0.18
CaO	trace
Na_2O	0.11
K_2O	0.15
P_2O_5	-
S (total)	-
C (org.)	-
CO_2	-
H_2O^-	0.29
H_2O^+	-
Ignition loss	16.60
Total	99.91

Mineralogy: Not determined.

Mineral	volume %
Quartz	
Feldspar	
Carbonate	
Mica	
Chlorite-vermiculite	
Montmorillonite	
Others	
Total	

Analyst E. Everhart, Ga. Geol. Survey. (in Veatch, 1909, p. 269; and Appendix B, p. 412-413, No. 43).

Date c.1909

Method Standard "wet".

Sample Location Data:

County Floyd. Land Lot 13 (?), Sec. 3, Dist. 22.

7 1/2' topo quad. Cedartown East (N. edge) and Rome South (S. edge). Lat. , Long. :

Field No. -, Collected by O. Veatch. Date c.1909.

Sample Method Grab(?) Weathering/alteration Residual(?) clay.

Structural Attitude -

Stratigraphic Assignment Eocene(?) residual clay.

Sample Description & Comments Sample is a white clay from the old Wear mine about 1 1/2 mi. SW. of Reesburg (Veatch, 1909, p. 269). The nearby Minter mines are described by Watson (1904, p. 105-106, Minter Bank) and White and others (1966, Plate 2).

Compiled by B.J. O'Connor Date 11-29-82

CERAMIC TESTS AND ANALYSES

Material Clay, alluvial. Compilation Map Location No. F1.09V-6

County Floyd. Sample Number -

Raw Properties: Lab & No. Ga. Geol.Survey.

Date Reported 1909 Ceramist O. Veatch, Ga. Geol. Survey.

Water of Plasticity - % Working Properties Plastic, fine-grained.

Color Bluish. Drying Shrinkage 8.2 % Dry Strength (tensile) 221 psi.

Slow Firing Tests:

Approx. Temp. °F (°C)	Color	Hardness	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data: Remarks
2210 (1210) (Cone 4)	Light yellow-buff	Steel hard	5.5	-	-	Not vitrified
2246 (1230) (Cone 5)	Very pale red	-	2.5	-	-	-

Remarks / Other Tests Could probably be used for dry press brick; possibly could be mixed with nearby Cambrian shales to make vitrified brick, but it is not sufficiently refractory by itself, to make vitrified, fire-clay products. It was blended with sandy clay by the Morrison-Trammel Brick Co. for making common building bricks (Veatch, 1909, p. 324-325).

Preliminary Bloating (Quick Firing) Tests: Not determined.

Crushing Characteristics (unfired material) ____-____

Particle Size ____-____ Retention Time ____-____

Chemical & Mineralogical Data: Not determined.

Chemical Analysis		Mineralogy	
Oxide	Weight %	Mineral	volume %
SiO_2			
TiO_2		Quartz	
Al_2O_3		Feldspar	
Fe_2O_3		Carbonate	
FeO		Mica	
MnO		Chlorite-vermiculite	
MgO		Montmorillonite	
CaO		Others	
Na_2O			
K_2O			
P_2O_5			
S (total)		Total	____
C (org.)			
CO_2			
H_2O^-			
H_2O^+			
Ignition loss	____		
Total			

Analyst ____ ____

Date ____ ____

Method ____ ____

Sample Location Data:

County Floyd. Land Lot ____, Sec. ____, Dist. ____.

7 1/2' topo quad. Rome North (S. edge). Lat. ____, Long. ____.

Field No. ____-____, Collected by O. Veatch. Date c.1909.

Sample Method Grab(?). Weathering/alteration ____

Structural Attitude ____-____

Stratigraphic Assignment Recent(?) alluvium of Etowah River.

Sample Description & Comments Sample from a 9 ft. thick bed of fine-grained, plastic, bluish clay (color due to a small amount of organic matter) from an exposure at the Morrison-Trammel Brick Co. plant in Rome. The section shows 5 ft. of overlying soil and yellow, sandy micaceous clay and an underlying 4 ft. of yellow sand and 3 ft. of black sand (Veatch, 1909, p. 324-325). Brick was made from a blend of 2/3 plastic clay and 1/3 yellow, sandy clay (not tested)

Compiled by B.J. O'Connor Date 11-29-82

CERAMIC TESTS AND ANALYSES

Material Clay, sandy (alluvial). Compilation Map Location No. Fl.09V-7a

County Floyd. Sample Number No.1.

Raw Properties: Lab & No. Ga. Geol. Survey, #41.

Date Reported 1909. Ceramist O. Veatch, Ga. Geol. Survey.

Water of Plasticity - % Working Properties Good plasticity.

Color Black (almost). Drying Shrinkage 8 % Dry Strength (ave. tensile) 215 psi.

Slow Firing Tests:

Approx. Temp. °F (°C)	Color	Hardness	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data: Remarks
1922 (1050) (Cone 05)	Salmon	-	0.7	-	-	Fair density
2066 (1130) (Cone 01)	Red	Almost steel hard	0.7	-	-	-
2210 (1210) (Cone 4)	Red	Steel hard	1.4	-	-	Not vitrified

Remarks / Other Tests "The air shrinkage is low and the clay does not crack or warp in burning." - possibly useful in making brick (Veatch, 1909, p. 326).

Preliminary Bloating (Quick Firing) Tests: Not determined.

Crushing Characteristics (unfired material) -

Particle Size - Retention Time -

Chemical & Mineralogical Data:

Chemical Analysis

Oxide	Weight %
SiO_2	72.65
TiO_2	1.15
Al_2O_3	11.92
Fe_2O_3	4.25
FeO	-
MnO	-
MgO	0.43
CaO	0.34
Na_2O	0.32
K_2O	0.80
P_2O_5	-
S (total)	-
C (org.)	*
CO_2	-
H_2O^-	1.72
H_2O^+	-
Ignition loss	6.60*
Total	100.18

(*organic matter present as suggested by black color of the clay.)

Mineralogy: Not determined.

Mineral	volume %
Quartz	
Feldspar	
Carbonate	
Mica	
Chlorite-vermiculite	
Montmorillonite	
Others	
Total	

Analyst E. Everhart, Ga. Geol. Survey. (in Veatch, 1909, p. 326, column II; also Appendix B, No. 41, p. 412-413)

Date c.1909.

Method Standard "wet".

Sample Location Data:

County Floyd. Land Lot , Sec. , Dist. .

7 1/2' topo quad. Rome North (SE. 1/4) (or Wax - NW.1/4?). Lat. , Long.

Field No. -, Collected by O. Veatch. Date c.1909.

Sample Method Grab(?) Weathering/alteration -

Structural Attitude -

Stratigraphic Assignment Recent(?) alluvium of the Etowah River.

Sample Description & Comments Sample from the W.T. Cheney property east of Rome and consisting of fine-grained alluvial clay, almost black in color due to organic matter. Although it has a high percentage of sand, it still has good plasticity (Veatch, 1909, p. 325-326).

Compiled by B.J. O'Connor Date 11-29-82

CERAMIC TESTS AND ANALYSES

Material Clay, sandy (alluvial). Compilation Map Location No. Fl.09V-7b

County Floyd. Sample Number No. 2

Raw Properties: Lab & No. Ga. Geol. Survey, #40

Date Reported 1909 Ceramist O. Veatch, Ga. Geol. Survey.

Water of Plasticity - % Working Properties Plasticity less than sample No. 1.

Color Yellow. Drying Shrinkage 3.9 % Dry Strength (tensile) 54 psi.

Slow Firing Tests:

Approx. Temp. °F (°C)	Color	Hardness	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data:
1850 (1010) (Cone 07)	Salmon	Very soft	0	-	-	-
1922 (1050) (Cone 05)	Salmon	Soft	0.3	-	-	-
2174 (1190) (Cone 3)	Dark red	Steel hard	2.0	-	-	-

Remarks / Other Tests Probably useful in making common brick.

Preliminary Bloating (Quick Firing) Tests: Not determined.

Crushing Characteristics (unfired material) -

Particle Size - Retention Time -

Chemical & Mineralogical Data:

Chemical Analysis

Oxide		Weight %
SiO_2		79.42
TiO_2		1.29
Al_2O_3		9.18
Fe_2O_3		4.25
FeO		-
MnO		-
MgO		0.35
CaO		trace
Na_2O		0.20
K_2O		0.72
P_2O_5		-
S	(total)	-
C	(org.)	-
CO_2		-
H_2O^-		0.80
H_2O^+		-
Ignition loss		3.89
Total		100.10

Mineralogy: Not determined.

Mineral	volume %
Quartz	
Feldspar	
Carbonate	
Mica	
Chlorite-vermiculite	
Montmorillonite	
Others	
Total	

Analyst E. Everhart, Ga. Geol. Survey (in Veatch, 1909, p. 326, column I: also Appendix B, p. 412-413, No. 40).

Date c.1909

Method Standard "wet".

Sample Location Data:

County Floyd. Land Lot , Sec. , Dist. .

7 1/2' topo quad. Rome North (SE. 1/4) (or Wax - NW. 1/4?). Lat. . Long.

Field No. -, Collected by O. Veatch. Date c.1909.

Sample Method Grab(?). Weathering/alteration -

Structural Attitude -

Stratigraphic Assignment Recent(?) alluvium of the Etowah River.

Sample Description & Comments Sample of a yellow, very sandy clay (surface alluvium) from the W. T. Cheney property east of Rome (Veatch, 1909, p. 325-326).

Compiled by B.J. O'Connor Date 11-29-82

CERAMIC TESTS AND ANALYSES

Material Shale (Conasauga Group). Compilation Map Location No. F1.09V-8

County Floyd. Sample Number -

Raw Properties: Lab & No. Ga. Geol. Survey, #38.

Date Reported 1909. Ceramist O. Veatch, Ga. Geol. Survey.

Water of Plasticity - % Working Properties Plasticity - poor.

Color Brown (or yellow?) Drying Shrinkage 2.5 % Dry Strength (tensile) 20 psi.

Slow Firing Tests:

Approx. Temp. °F (°C)	Color	Hardness	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data: Remarks
1922 (1050) (Cone 05)	Red	Steel hard	2.3	-	-	-
1994 (1090) (Cone 03)	Dark red	(Steel hard?)	5.5	-	-	Vitrified
2066 (1130) (Cone 01)	Dark red	(Steel hard?)	6.6	-	-	Vitrified
2138 (1170) (Cone 2)	Almost black	(Steel hard?)	5.0	-	-	Warped
2210 (1210) (Cone 4)	-	(Steel hard?)	-	-	-	"Burned to a cinder"

Remarks / Other Tests Possibly suitable for brick manufacture if blended with plastic clay to increase plasticity, green strength and firing range (Veatch, 1909, p. 394.)

Preliminary Bloating (Quick Firing) Tests: Not determined.

Crushing Characteristics (unfired material) -

Particle Size - Retention Time -

Chemical & Mineralogical Data:

Chemical Analysis

Oxide		Weight %
SiO_2		55.33
TiO_2		1.10
Al_2O_3		22.01
Fe_2O_3		5.95
FeO		-
MnO		trace
MgO		1.57
CaO		0.49
Na_2O		0.82
K_2O		7.13
P_2O_5		-
S	(total)	0.07
C	(org.)	-
CO_2		-
H_2O^-		0.42
H_2O^+		-
Ignition loss		4.71
Total		99.60

Mineralogy: Not determined.

Mineral	volume %
Quartz	
Feldspar	
Carbonate	
Mica	
Chlorite-vermiculite	
Montmorillonite	
Others	
Total	

Analyst E. Everhart, Ga. Geol. Survey (in Veatch, 1909, p. 117, column III, also p. 394, and Appendix B, No. 38, p. 412-413).

Date c.1909.

Method Standard "wet".

Sample Location Data:

County Floyd. Land Lot , Sec. , Dist. .

7 1/2' topo quad. Shannon (SW. 1/4)(or Rome North-SE. 1/4?). Lat. ,Long.

Field No. 38 (?), Collected by O. Veatch. Date c.1909

Sample Method Grab(?) Weathering/alteration Weathered.

Structural Attitude -

Stratigraphic Assignment Conasauga Group (Cambrian) shale.

Sample Description & Comments The sample was collected adjacent to the Southern RR., 3 miles N. of Rome, and is a yellow (and ?) brown, very sandy, micaceous shale (Veatch, p. 393-394).

Compiled by B.J. O'Connor Date 11-29-82

CERAMIC TESTS AND ANALYSES

Material Shale, soft and micaceous (Conasauga). Compilation Map Location No. Fl.09V-9

County Floyd. Sample Number -

Raw Properties: Lab & No. Ga. Geol. Survey.

Date Reported 1909. Ceramist O. Veatch, Ga. Geol. Survey.

Water of Plasticity - % Working Properties Poor plasticity.

Color Brown or yellow. Drying Shrinkage 1.4 % Dry Strength (tensile) 25 psi.

Slow Firing Tests:

Temp. °F (°C)	Color	Hardness	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data:
"Low"	Red	"Good"	-	-	-	-

Remarks / Other Tests "This shale is of little value for brick purposes, unless mixed with a plastic clay." (Veatch, 1909, p. 395).

Preliminary Bloating (Quick Firing) Tests: Not determined.

Crushing Characteristics (unfired material) -

Particle Size - Retention Time -

Chemical & Mineralogical Data: Not determined.

Chemical Analysis		Mineralogy	
Oxide	Weight %	Mineral	volume %
SiO_2			
TiO_2		Quartz	
Al_2O_3		Feldspar	
Fe_2O_3		Carbonate	
FeO		Mica	
MnO		Chlorite-vermiculite	
MgO		Montmorillonite	
CaO		Others	
Na_2O			
K_2O			
P_2O_5			
S (total)		Total	
C (org.)			
CO_2			
H_2O^-			
H_2O^+			
Ignition loss			
Total			

Analyst _____ _____

Date _____ _____

Method _____ _____

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. Shannon (NE. 1/4) . Lat. _____, Long. _____.

Field No. -, Collected by O. Veatch. Date c.1909.

Sample Method Grab(?) Weathering/alteration Weathered.

Structural Attitude -

Stratigraphic Assignment Conasauga Group (Cambrian) shale.

Sample Description & Comments A small sample from east of Shannon composed of a brown or yellow, soft, micaceous shale which is closely jointed and weathers into small angular chips (Veatch, 1909, p. 394-395).

Compiled by B.J. O'Connor Date 11-29-82

CERAMIC TESTS AND ANALYSES

Material Brown shale (Floyd). Compilation Map Location No. F1.31S-A

County Floyd. Sample Number -

Raw Properties: Lab & No. Ga. Tech.

Date Reported 1931. Ceramist A. V. Henry, Ga. Tech.

Water of Plasticity - % Working Properties Fair plasticity.

Color Dark brown. Drying Shrinkage 3.8 % Dry Strength (MOR) 92 psi.

Slow Firing Tests:

Temp. °F (°C)	Color	Hardness	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data: "Density"
1995 (1090)	Salmon, spotted	-	7.5	-	-	Fair
2174 (1190)	Medium red	-	8.3	-	-	Good

Remarks / Other Tests Reported in Smith (1931, p. 84).

Preliminary Bloating (Quick Firing) Tests: Not determined.

Crushing Characteristics (unfired material) -

Particle Size - Retention Time -

Chemical & Mineralogical Data:

Chemical Analysis: Not determined.

Oxide	Weight %
SiO_2	
TiO_2	
Al_2O_3	
Fe_2O_3	
FeO	
MnO	
MgO	
CaO	
Na_2O	
K_2O	
P_2O_5	
S (total)	
C (org.)	
CO_2	
H_2O^-	
H_2O^+	
Ignition loss	
Total	

Mineralogy-partial

Mineral	volume %
Quartz	
Feldspar	
Calcium Carbonate	none
Mica	
Chlorite-vermiculite	
Montmorillonite	
Others	
Total	-

Analyst _____ A. V. Henry, Ga. Tech.

Date _____ c. 1929?

Method _____ HCl effervescence ?

Sample Location Data:

County Floyd. Land Lot about 126, Sec. 4, Dist. 4.

7 1/2' topo quad. Rome North (SW. 1/4). Lat. _____, Long. _____.

Field No. -, Collected by A. V. Henry Date c.1926?

Sample Method Grab ? Weathering/alteration Unweathered.

Structural Attitude Beds strike about N.65-70°E., dip about 65°S. (Smith, 1931, p. 83).

Stratigraphic Assignment Floyd Shale (Mississippian).

Sample Description & Comments Sample of stratified shale from RR. cut on the Camp and Knowles properties about 1/2 mi. W. of the Dickey shale pit (31S-6) and 2 3/4 mi. NW. of Rome at mile post S-374.5 on the Central of Ga. RR. The cut is about 125 ft. long, averages 6 ft. high, and exposes gray to brown, semi-hard, fissile shale with common interbedded sandstone and chert layers less than 1 in. thick. The cut crosses a low ridge between two branches of Little Dry Creek (Smith, 1931, p. 83-84).

Compiled by B.J. O'Connor Date 11-29-82

CERAMIC TESTS AND ANALYSES

Material Shale (Floyd). Compilation Map Location No. F1.31S-B

County Floyd. Sample Number -

Raw Properties: Lab & No. Ga. Tech.

Date Reported 1931. Ceramist A. V. Henry, Ga. Tech.

Water of Plasticity - % Working Properties Good plasticity.

Color Dark gray. Drying Shrinkage 4.6 % Dry Strength -

Slow Firing Tests:

Temp. °F (°C)	Color	Hardness	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data: "Density"
1950 (1066)	Mottled red and white	-	8.7	-	-	Fair
2110 (1154)	Fair red, mottled with white	-	9.2	-	-	Good

Remarks / Other Tests Excellent working properties, but the fired colors are not well suited to the manufacture of face brick. However, this shale could be used in making common building brick and hollow tile (A. V. Henry in Smith, 1931, p. 85). Formerly mined by Stevens, Inc. for use in manufacture of sewer pipe at their plant at Stevens Pottery, Baldwin County.

Preliminary Bloating (Quick Firing) Tests: Not determined.

Crushing Characteristics (unfired material) -

Particle Size - Retention Time -

Chemical & Mineralogical Data:

Chemical Analysis: Not determined.

Oxide	Weight %
SiO_2	
TiO_2	
Al_2O_3	
Fe_2O_3	
FeO	
MnO	
MgO	
CaO	
Na_2O	
K_2O	
P_2O_5	
S (total)	
C (org.)	
CO_2	
H_2O^-	
H_2O^+	
Ignition loss	
Total	

Mineralogy-partial

Mineral	volume %
Quartz	
Feldspar	
Calcium Carbonate	none
Mica	
Chlorite-vermiculite	
Montmorillonite	
Others	
Total	-

Analyst _____ A. V. Henry, Ga. Tech.

Date _____ c.1929 ?

Method _____ HCl effervescence ?

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. Rome North (SW. 1/4) . Lat. _____, Long. _____.

Field No. - , Collected by A. V. Henry Date c.1926 ?

Sample Method Grab ? Weathering/alteration Weathered ?

Structural Attitude Beds strike N.50°E. and dip approx. 50°NW. (Smith, 1931, p. 84).

Stratigraphic Assignment Floyd Shale (Mississippian).

Sample Description & Comments Shale from the Dean property adjacent to and N. of the Central of Ga. RR at mile post S-375, 3-1/2 mi. NW. of Rome, 1-3/4 mi. S. of Morrison. Sample from a small pit (less than 1 acre and less than 15 ft. deep) formerly mined by Stevens, Inc. It ranges from hard, dark gray shale with brown streaks to soft, light brown, gray and white shale with a few thin cherty layers and local hard, sandy shale to argillaceous sandstone (Smith, 1931, p. 84).

Compiled by B.J. O'Connor Date 11-29-82

CERAMIC TESTS AND ANALYSES

Material Shale, weathered (Floyd). Compilation Map Location No. Fl.31S-C

County Floyd. Sample Number -

Raw Properties: Lab & No. Ga. Tech.

Date Reported 1926. Ceramist A. V. Henry, Ga. Tech.

Water of Plasticity - % Working Properties Plasticity-excellent.

Color Tan. Drying Shrinkage 6.2 % Dry Strength (MOR) 200 psi.

Slow Firing Tests:

Temp. °F (°C)	Color	Hardness	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data: "Density"
1900 (1038)	Salmon	-	10.4	-	-	Fair
2174 (1190)	Deep red	-	13.5	-	-	Good

Remarks / Other Tests Reported in Smith (1931, p.99).

Preliminary Bloating (Quick Firing) Tests: Not determined.

Crushing Characteristics (unfired material) -

Particle Size - Retention Time -

Chemical & Mineralogical Data:

Chemical Analysis: Not determined.

Oxide	Weight %
SiO_2	
TiO_2	
Al_2O_3	
Fe_2O_3	
FeO	
MnO	
MgO	
CaO	
Na_2O	
K_2O	
P_2O_5	
S (total)	
C (org.)	
CO_2	
H_2O^-	
H_2O^+	
Ignition loss	
Total	

Mineralogy-partial

Mineral	volume %
Quartz	
Feldspar	
Calcium Carbonate	none
Mica	
Chlorite-vermiculite	
Montmorillonite	
Others	
Total	-

Analyst - A. V. Henry, Ga. Tech.

Date - c. 1929

Method - HCl effervescence ?

Sample Location Data:

County Floyd. Land Lot -, Sec. -, Dist. -.

7 1/2' topo quad. Rock Mountain (cntr.). Lat. -, Long. -.

Field No. -, Collected by A. V. Henry Date c.1926?

Sample Method Grab ? Weathering/alteration Weathered.

Structural Attitude -

Stratigraphic Assignment Floyd Shale (Mississippian).

Sample Description & Comments Mottled light and medium tan, soft, weathered shale from a cut on the Central of Ga. RR. at mile post S-381.5, 3/4 mi. E. of the Lavender Station --probably corresponds to the eastern edge of the Schlapback property just west of the Long property (see Fl.31S-11a and b, Smith, 1931, p. 99).

Compiled by B.J. O'Connor Date 11-29-82

CERAMIC TESTS AND ANALYSES

Material Shale (Floyd) and some clay. Compilation Map Location No. Fl.31S-5a

County Floyd. Sample Number R-1-A

Raw Properties: Lab & No. Ga. Tech., #5.

Date Reported 1931. Ceramist R. W. Smith, Ga. Geol. Survey.

Water of Plasticity 26.1 % Working Properties Poor and grainy plasticity at first (good after aging overnight); a little slow slaking; good molding behavior.

Color Light brown. Drying Shrinkage 4.2 % Dry Strength -

Remarks Drying behavior: test bars slightly warped.

Slow Firing Tests:

Approx. Temp. °F (°C)	Color* (Munsell)	Hardness (MOR)psi.	Linear Shrinkage, % dry (plastic)	Absorption %	Appr. Por. %	Other data: Warpage
1840 (1005)	Salmon (5YR-7/8)	844	3.6 (7.9)	16.9	-	Slight.
1920 (1050)	Salmon (5YR-7/6)	1005	4.9 (9.0)	13.9	-	Slight.
2000 (1095)	Light red (10R-6/6)	1435	5.6 (9.7)	11.6	-	Slight.
2060 (1125)	Medium red (10R-5/5)	1663	8.1 (11.7)	9.2	-	Some.
2090 (1145)	Deep red (10R-5/4)	2261	7.6 (11.7)	6.2	-	Considerable.
2160 (1180)	Dark red (10R-5/4)	2263	8.5 (12.2)	6.2	-	Some.

Remarks / Other Tests Firing Range = Cone 1 to 5 (commercial kiln = Cone 01 to 4). This shale was used by the Berry Schools to make building brick. Prior to 1929 it it was blended with clay (Fl.31S-5b) to make building brick and structural tile by the Romega Clay Products Co. (Smith, 1931, p. 75).

Preliminary Bloating (Quick Firing) Tests: Not determined.

*Note: Munsell color notations "5YR" and "10R" correspond to the original notations "YR" and "R-YR" respectively reported in Smith (1931).

Crushing Characteristics (unfired material) Easy grinding.

Particle Size -16 mesh. Retention Time Approx. 17 hours.

Chemical & Mineralogical Data:

Chemical Analysis

Oxide	Weight %
SiO_2	57.99
TiO_2	0.93
Al_2O_3	25.17
Fe_2O_3	6.30
FeO	0.60
MnO	-
MgO	0.13
CaO	0.00
Na_2O	0.84
K_2O	0.66
P_2O_5	0.11
SO_3	0.35
C (org.)	-
CO_2	-
H_2O^-	*
H_2O^+	-
Ignition loss	7.06
Total	100.14*

Mineralogy: Not determined.

Mineral	volume %
Quartz	
Feldspar	
Carbonate	
Mica	
Chlorite-vermiculite	
Montmorillonite	
Others	
Total	

(* = analysis recalculated on an H_2O^- -free basis by Smith, 1931, p. 76.)

Analyst E. Everhart, Ga. Geol. Survey.

Date c.1930.

Method Standard "wet".

Sample Location Data:

County Floyd. Land Lots 203 & 238. Sec. 3, Dist. 23.

7 1/2' topo quad. Rome North (S. side). Lat. _____, Long. _____.

Field No. R-1-A, Collected by R. W.Smith. Date 7-25-29

Sample Method 6 ft. groove. Weathering/alteration Weathered.

Structural Attitude Beds strike "nearly east-west" and dip about 80° S.

Stratigraphic Assignment Floyd Shale (Mississippian).

Sample Description & Comments Semi-hard, greenish-brown shale with "considerable black stain" (Mn oxide ?) with interbedded layers of brown clay which is sometimes sandy (weathered argillaceous limestone-residual clay) from the "North Pit" (about 50 by 100 ft. and averaging 10 ft. deep.) It is located about 1/8 mi. N. of the brick plant (NE. of the intersection of the Southern RR. and the Central of Ga. RR.) near the Central of Ga. spur track to the Berry Schools (Smith, 1931, p. 75-78; also Furcron, 1958, p. 5, No. 20 - no further ceramic tests).

Compiled by B. J. O'Connor Date 2-10-86

CERAMIC TESTS AND ANALYSES

Material Clay, colluvial. Compilation Map Location No. F1.31S-5b

County Floyd. Sample Number R-1-B

Raw Properties: Lab & No. Ga. Tech., #5.

Date Reported 1931 Ceramist R. W. Smith, Ga. Geol. Survey.

Water of Plasticity 31.6% Working Properties Excellent plasticity; rapid slaking; excellent molding behavior.

Color Yellow. Drying Shrinkage 7.2% Dry Strength (MOR) 172.7 psi.

Remarks Drying behavior: little or no warpage.

Slow Firing Tests:

Approx. Temp. °F (°C)	Color* (Munsell)	Hardness (MOR) psi.	Linear Shrinkage, % dry (plastic)	Absorption %	Appr. Por. %	Other data: Warpage
1840 (1105)	Salmon (5YR-7/9)	646	1.1 (8.2)	23.0	-	Little or none.
1920 (1050)	Salmon (3YR-7/6)	817	2.0 (8.5)	20.8	-	Slight.
2000 (1095)	Salmon red (10R-6/7)	953	2.3 (9.3)	19.8	-	Slight.
20600 (1125)	Light red (10R-5/7)	976	3.1 (10.3)	18.3	-	Slight.
2090 (1145)	Fair red (10R-5/6)	1051	3.0 (10.5)	18.9	-	Slight.
2160 (1180)	Medium red (10R-5/5)	1143	3.5 (10.5)	17.3	-	Slight.

Remarks / Other Tests Firing range not reached (clay is rather refractory). Prior to 1929 the Romega Clay Products Co. used the clay in blends (2 parts clay and 1 part shale from the "North Pit") to make structural tile and building brick (Smith, 1931, p. 75 and 80).

Preliminary Bloating (Quick Firing) Tests: Not determined.

*Note: Munsell color notations "5YR" and "10R" correspond to the original notations "YR" and "R-YR" respectively reported in Smith (1931).

Crushing Characteristics (unfired material) Easy grinding.

Particle Size -16 mesh. Retention Time Approx. 17 hours.

Chemical & Mineralogical Data:

Chemical Analysis

Oxide	Weight %
SiO_2	69.49
TiO_2	0.91
Al_2O_3	10.58
Fe_2O_3	8.41
FeO	-
MnO	-
MgO	0.80
CaO	-
Na_2O	0.73
K_2O	1.51
P_2O_5	trace
SO_3	0.00
C (org.)	-
CO_2	-
H_2O^-	*
H_2O^+	-
Ignition loss	7.75
Total	100.18*

(* = analysis recalculated on an H_2O^- -free basis by Smith, 1931, p. 79.)

Mineralogy: Not determined.

Mineral	volume %
Quartz	
Feldspar	
Carbonate	
Mica	
Chlorite-vermiculite	
Montmorillonite	
Others	
Total	

Analyst E. Everhart, Ga. Geol. Survey.

Date c.1930

Method Standard "wet".

Sample Location Data:

County Floyd. Land Lots 203 and 238. Sec. 3, Dist. 23.

7 1/2' topo quad. Rome North (S. side). Lat. _____, Long. _____.

Field No. R-1-B, Collected by R. W. Smith. Date 7-25-29

Sample Method Groove samples-2 of 6 ft. each from different parts of the pit. Weathering/alteration Weathered.

Structural Attitude The few recognizable bedding surfaces appear nearly horizontal.

Stratigraphic Assignment Recent (?) colluvial clay (+ some residual?) from Mississippian Ft. Payne Chert and Floyd Shale.

Sample Description & Comments As described by Smith (1931, p. 78; and Furcron, 1958, p. 5, No. 20) the "South Pit" (about 300 by 75 ft. and averaging 20 ft. deep) is located 200 yards SE. of the brick plant adjacent to the Southern RR. (The plant is NE. of the junction of the Southern and the Central of Ga. RR. lines in west Rome.) The clay shows extreme variation in color, ranging from reddish-brown to mottled yellow, locally contains numerous angular to rounded chert pebbles up to several inches in diameter, and has a gummy plasticity.

Compiled by B. J. O'Connor Date 2-10-86

CERAMIC TESTS AND ANALYSES

Material Shale (Floyd). Compilation Map Location No. F1.31S-6

County Floyd. Sample Number R-2

Raw Properties: Lab & No. Ga. Tech., #6.

Date Reported 1931. Ceramist R. W. Smith, Ga. Geol. Survey.

Water of Plasticity 25.7% Working Properties Fairly good plasticity; fairly good slaking; good molding behavior.

Color Light brown-ish-gray. Drying Shrinkage 3.6 % Dry Strength (MOR) 144.8 psi.

Remarks Drying behavior: all test bars slightly warped.

Slow Firing Tests:

Approx. Temp. °F (°C)	Color* (Munsell)	Hardness (MOR) psi.	Linear Shrinkage, % dry (plastic)	Absorption %	Appr. Por. %	Other data: Warpage
1840 (1005)	Pinkish-tan (5YR-8/4)	778	2.5 (6.1)	19.9	-	Very slight.
1920 (1050)	Buff-pink tan (5YR-7/5)	1209	3.9 (7.5)	16.5	-	Very slight.
2000 (1095)	Tan-brown (5YR-7/5)	1522	4.8 (8.2)	13.4	-	Very slight.
2060 (1125)	Light brown (5YR-6/6)	1569	6.0 (9.4)	13.2	-	Slight.
2090 (1145)	Dead light-brown(5YR-6/5)	1705	6.2 (9.6)	11.9	-	Some.
2160 (1180)	Dead light-brown (5YR-5/5)	1987	6.3 (9.6)	10.5	-	Slight.

Remarks / Other Tests Firing range = Cone 1 to 5 and higher. This shale was used by the W. S. Dickey Clay Mfg. Company, in mixtures with Tenn. shale and Ala. fire clay, to manufacture sewer pipe at their plants in east Rome and Macon, Ga. (Smith, 1931, p. 81-83 and p. 307). Shale was mined from 1920 to about 1928.

Preliminary Bloating (Quick Firing) Tests: Not determined.

*Note: Munsell color notation "5YR" corresponds to the original notation "YR" reported in Smith (1931).

Crushing Characteristics (unfired material) Fairly easy, brittle grinding.

Particle Size -16 mesh. Retention Time Approx. 17 hours.

Chemical & Mineralogical Data:

Chemical Analysis

Oxide	Weight %
SiO_2	66.94
TiO_2	0.55
Al_2O_3	16.34
Fe_2O_3	4.33
FeO	0.32
MnO	0.00
MgO	0.48
CaO	0.00
Na_2O	2.74
K_2O	1.88
P_2O_5	0.27
S (total)	-
C (org.)	-
CO_2	-
H_2O^-	*
H_2O^+	-
Ignition loss	6.16
Total	100.01*

(* = analysis recalculated on an H_2O^- -free basis by Smith, 1931, p. 82.)

Mineralogy: Not determined.

Mineral	volume %
Quartz	
Feldspar	
Carbonate	
Mica	
Chlorite-vermiculite	
Montmorillonite	
Others	
Total	

Analyst E. Everhart, Ga. Geol. Survey.

Date c.1930.

Method Standard "wet".

Sample Location Data:

County Floyd. Land Lot 201, Sec. 3, Dist. 23.

7 1/2' topo quad. Rome North (S. cntr.). Lat. _____, Long. _____.

Field No. R-2, Collected by R. W. Smith. Date 7-25-29.

Sample Method Grab samples. Weathering/alteration Weathered.

Structural Attitude Variable attitudes.

Stratigraphic Assignment Floyd Shale (Mississippian) - possibly with some Cambrian Conasauga shale?

Sample Description & Comments Variable shale from the Rome Shale Pit of the Dickey Clay Mfg. Co. Much is dark brown or dark grey, but it ranges from a soft (almost clay-like) reddish-brown, to gray to almost black shale to a hard, drab or greenish-drab shale. Some fresh shale is slightly calcareous and contains area of interbedded sandstone. Representative samples taken from a large irregular pit (about 10 acres) averaging 20 ft. deep between the Central of Ga. and the Southern RR. tracks in west Rome, about 1 mi. W. of the Romega Clay Products plant (see Fl. 31S-5) (Smith, 1931, p.80-83 and Furcron, 1958, p.5, No. 21 - no further ceramic tests).

Compiled by B. J. O'Connor Date 2-17-86

CERAMIC TESTS AND ANALYSES

Material Soft shale (Floyd). Compilation Map Location No. FL.31S-7a

County Floyd. Sample Number R-71A

Raw Properties: Lab & No. Ga.Tech., #7.

Date Reported 1931. Ceramist R. W. Smith, Ga. Geol. Survey.

Water of Plasticity 23.5 % Working Properties Grainy plasticity at first (good on aging overnight); fairly rapid slaking; fair molding behavior - slight tearing.

Color Light brown Drying Shrinkage 2.9 % Dry Strength (MOR) 161.9 psi.

Remarks Drying Behavior: good.

Slow Firing Tests:

Approx. Temp. °F (°C)	Color* (Munsell)	Hardness (MOR) psi.	Linear Shrinkage, % dry (plastic)	Absorption %	Appr. Por. %	Other data: Warpage
1840 (1005)	Pale salmon (5YR-8/4)	918	1.9 (4.8)	17.6	-	None.
1920 (1050)	Light salmon (5YR-7/6)	1043	2.6 (5.4)	16.2		None.
2000 (1095)	Reddish salmon (5YR-7/5)	1419	3.6 (6.5)	14.1	-	None.
2060 (1125)	Light brownish red (5YR-6/6)	1720	5.0 (7.8)	12.1	-	Very slight.
2090 (1145)	Medium brownish red (5YR-6/5)	1967	5.8 (8.4)	10.3	-	Considerable.
2160 (1180)	Medium brownish red (5YR-5/5)	2310	5.9 (8.8)	8.8	-	Some.

Remarks / Other Tests Firing Range = Cone 3 to 5 and higher (commercial kiln = Cone 1 to 5 and possibly higher). The shale is suitable for making brick and tile; blending with a red-firing shale or clay (eg. 31S-7b below) would improve the fired color (Smith, 1931, p. 87).

Preliminary Bloating (Quick Firing) Tests: Not determined.

*Note: Munsell color notation "5YR" corresponds to the original notation "YR" reported in Smith (1931).

Crushing Characteristics (unfired material) Easy grinding.

Particle Size -16 mesh. Retention Time Approx. 17 hours.

Chemical & Mineralogical Data:

Chemical Analysis

Oxide	Weight %
SiO_2	69.75
TiO_2	0.37
Al_2O_3	15.91
Fe_2O_3	5.12
FeO	-
MnO	-
MgO	1.51
CaO	0.00
Na_2O	0.45
K_2O	1.21
P_2O_5	trace
SO_3	0.00
C (org.)	-
CO_2	-
H_2O^-	*
H_2O^+	-
Ignition loss	5.81
Total	100.13*

(* = analysis recalculated on an H_2O^- -free basis by Smith, 1931, p. 86.)

Mineralogy: Not determined.

Mineral	volume %
Quartz	
Feldspar	
Carbonate	
Mica	
Chlorite-vermiculite	
Montmorillonite	
Others	
Total	

Analyst E. Everhart, Ga. Geol. Survey.

Date c.1930.

Method Standard "wet".

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. Rock Mountain (E. Cntr.). Lat._____, Long. _____.

Field No. R-71A, Collected by R. W. Smith. Date 7-5-30

Sample Method Grab samples. Weathering/alteration Weathers into fine, soft to waxy flakes.

Structural Attitude -

Stratigraphic Assignment Floyd Shale (Mississippian).

Sample Description & Comments Shale from the T. Berry property (both sides of the Central of Ga. RR. at Berryhill Stn.) about 6.5 miles NW. of Rome. Samples from cuts along Huffaker Rd. S. of the station and from fields, N. and S. of the road, S. of the RR. It ranges from soft, dark gray to black or brown and locally show beds of dark blue, argillaceous and siliceous limestone (Smith, 1931, p. 85-87; also Furcron, 1958, p.5, No. 22 - no further ceramic tests).

Compiled by B. J. O'Connor Date 2-10-86

CERAMIC TESTS AND ANALYSES

Material Red clay (residual). Compilation Map Location No. F1.31S-7b

County Floyd. Sample Number R-71B

Raw Properties: Lab & No. Ga. Tech., #7.

Date Reported 1931. Ceramist R. W. Smith, Ga. Geol. Survey.

Water of Plasticity 39.8 % Working Properties Good plasticity, somewhat sticky; rapid slaking; laminated considerably on extrusion.

Color Reddish-brown. Drying Shrinkage 11.3 % Dry Strength (MOR) 174.5 psi (but variable due to lamination).

Remarks Drying Behavior: test bars slightly warped.

Slow Firing Tests:

Approx. Temp. °F (°C)	Color* (Munsell)	Hardness (MOR) psi.	Linear Shrinkage, % dry (plastic)	Absorption %	Appr. Por. %	Other data: Warpage
1840 (1005)	Salmon (5YR-6/6)	940	3.9 (14.8)	17.5	-	Slight.
1920 (1050)	Dark salmon (7YR-7/5)	973	4.0 (14.9)	15.8	-	Slight.
2000 (1095)	Fair red (10R-5/5)	541	5.2 (15.9)	14.1	-	Slight.
2060 (1125)	Fair red (10R-5/5)	1058	6.6 (17.1)	12.5	-	Slight.
2090 (1145)	Good red (10R-5/5)	1178	4.9 (15.7)	13.2	-	Considerable.
2160 (1180)	Good red (10R-5/5)	993	5.4 (16.1)	11.9	-	Some.

Remarks / Other Tests Firing range = Cone 04 to 5 and higher. The lack of uniform results is largely due to the lamination of the test bars upon extrusion. If used by itself the clay is suitable only for making common building brick. It could also be used in blends with other materials (eg. 31S-7a above) to improve the fired colors (Smith, 1931, p. 88).

Preliminary Bloating (Quick Firing) Tests: Not determined.

*Note: Munsell color notations "5YR" and "10R" correspond to the original notations "YR" and "R-YR" respectively reported in Smith (1931).

Crushing Characteristics (unfired material) Easy grinding.

Particle Size -16 mesh. Retention Time Approx. 17 hours.

Chemical & Mineralogical Data:

Chemical Analysis

Oxide	Weight %
SiO_2	63.01
TiO_2	1.38
Al_2O_3	14.69
Fe_2O_3	8.98
FeO	-
MnO	-
MgO	0.45
CaO	0.00
Na_2O	0.68
K_2O	0.44
P_2O_5	trace
SO_3	0.00
C (org.)	-
CO_2	-
H_2O^-	*
H_2O^+	-
Ignition loss	9.42
Total	99.05*

(* = analysis recalculated on an H_2O^- -free basis by Smith, 1931, p. 87.)

Mineralogy: Not determined.

Mineral	volume %
Quartz	
Feldspar	
Carbonate	
Mica	
Chlorite-vermiculite	
Montmorillonite	
Others	
Total	

Analyst E. Everhart, Ga. Geol. Survey.

Date c.1930.

Method Standard "wet".

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. Rock Mountain (E. cntr.). Lat._____, Long. _____.

Field No. R-71B, Collected by T. Berry. Date 7-5-30

Sample Method Grab samples. Weathering/alteration Residual clay.

Structural Attitude -

Stratigraphic Assignment Recent (?) residual clay from impure limestone in the Floyd Shale (Mississippian).

Sample Description & Comments Samples of stiffly plastic, deep brick-red clay from several outcrops on low ridges north of the Central of Ga. RR. near Berryhill Station, 6 1/2 miles NW. of Rome. Collected by the owner of the T. Berry property (Smith, 1931, p. 85-88; also Furcron, 1958, p. 5, No. 22 - no further ceramic tests.

Compiled by B. J. O'Connor Date 2-10-86

CERAMIC TESTS AND ANALYSES

Material Soft shale (Floyd). Compilation Map Location No. F1.31S-8

County Floyd. Sample Number R-72

Raw Properties: Lab & No. Ga. Tech., #8.

Date Reported 1931. Ceramist R. W. Smith, Ga. Geol. survey.

Water of Plasticity 24.9 % Working Properties Good plasticity; rapid slaking; and good molding behavior.

Color Drab. Drying Shrinkage 4.6 % Dry Strength (MOR) 199.1 psi.

Remarks Drying Behavior: Good.

Slow Firing Tests:

Approx. Temp. °F (°C)	Color* (Munsell)	Hardness (MOR) psi.	Linear Shrinkage, % dry (plastic)	Absorption %	Appr. Por. %	Other data: Warpage
1840n (1005)	Pale salmon (5YR-7/4)	1063	2.4 (6.7)	16.7	-	Slight.
1920 (1050)	Light salmon (5YR-7/5)	1294	2.8 (7.2)	15.4	-	Slight.
2000 (1095)	Medium salmon (5YR-7/6)	1789	4.6 (8.9)	12.0	-	None.
2060 (1125)	Light brownish red (5YR-6/6)	1943	5.7 (10.2)	10.4	-	None.
2090 (1145)	Light brownish red (5YR-6/6)	1982	6.3 (10.5)	10.0	-	Slight.
2160 (1180)	Medium brownish red (5YR-6/5)	2184	6.5 (11.2)	9.1	-	Slight.

Remarks / Other Tests Firing Range = Cone 1 to 5 and higher (commercial kiln = Cone 01 to 5 and possibly higher). According to Smith (1931, p. 91) the sampled shale is suitable for making brick and tile although the color is poor (which could be improved by blending with red-firing materials such as the surface clay 31S-7b). This shale was mined by the Rome Brick Co. and the Oconee Clay Products Co. (Milledgeville) (Furcron, 1958, p. 5, No. 23-25 - no further ceramic tests).

Preliminary Bloating (Quick Firing) Tests: Not determined.

*Note: Munsell color notation "5YR" corresponds to the original notation "YR" reported in Smith (1931).

Crushing Characteristics (unfired material) Easy grinding.

Particle Size -16 mesh. Retention Time Approx. 17 hours.

Chemical & Mineralogical Data:

Chemical Analysis

Oxide	Weight %
SiO_2	65.02
TiO_2	0.55
Al_2O_3	21.67
Fe_2O_3	5.26
FeO	-
MnO	-
MgO	0.05
CaO	0.00
Na_2O	0.47
K_2O	0.86
P_2O_5	trace
SO_3	0.00
C (org.)	-
CO_2	-
H_2O^-	*
H_2O^+	-
Ignition loss	6.07
Total	99.95*

(* = analysis recalculated on an H_2O^- -free basis by Smith, 1931, p. 90.)

Mineralogy: Not determined.

Mineral	volume %
Quartz	
Feldspar	
Carbonate	
Mica	
Chlorite-vermiculite	
Montmorillonite	
Others	
Total	

Analyst E. Everhart, Ga. Geol. Survey.

Date c. 1930.

Method Standard "wet".

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. Rock Mountain (E. cntr.). Lat. _____, Long. _____.

Field No. R-72, Collected by R. W. Smith. Date 7-5-30

Sample Method Grab samples. Weathering/alteration Weathered.

Structural Attitude (On Central of Ga. RR.) strike NE. - SW., dip approx. 45° SE.

Stratigraphic Assignment Floyd Shale (Mississippian).

Sample Description & Comments Samples of soft, gray to drab and grayish-lavender, flaky and waxy shale from outcrops in a valley between 2 low ridges 1/4 mi. S of the Central of Ga. RR. along a private road (leading south to the "Alabama Road" -Ga. Hwy. 20) on the Berryhill Estate 7 miles NW. of Rome and 1/2 mile W. of Berryhill Station (Smith, 1931, p. 88-91). The shale in this area was mined by the Rome Brick Co. and the Oconee Clay Products Co.(Milledgeville) in 1957 (Furcron, 1958, p. 5, No. 23 to 25 - no further ceramic tests).

Compiled by B. J. O'Connor Date 2-10-86

CERAMIC TESTS AND ANALYSES

Material Soft shale (Floyd). Compilation Map Location No. Fl.31S-9

County Floyd. Sample Number R-27

Raw Properties: Lab & No. Ga. Tech., #9

Date Reported 1931. Ceramist R. W. Smith, Ga. Geol. Survey.

Water of Plasticity 26.8 % Working Properties Good plasticity; rapid slaking; and excellent molding behavior.

Color Brownish-gray. Drying Shrinkage 5.7 % Dry Strength (MOR) 224.6 psi.

Remarks Drying Behavior: test bars a little slow in drying and warped slightly.

Slow Firing Tests:

Approx. Temp. °F (°C)	Color (Munsell)	Hardness (MOR) psi.	Linear Shrinkage, % dry (plastic)	Absorption %	Appr. Por. %	Other data: Warpage
1840 (1005)	Pale salmon (6YR-7/5)	1059	2.5 (8.1)	17.2	-	Slight.
1920 (1050)	Light salmon (7YR-7/5)	1266	3.7 (8.7)	14.5	-	Some.
2000 (1095)	Light salmon (7YR-7/5)	1728	5.2 (10.6)	12.0	-	Some.
2060 (1125)	Medium salmon (4YR-6/5)	1987	7.2 (12.2	8.5	-	Some.
2090 (1145)	Light brownish-red (3YR-6/4)	1968	6.5 (11.7)	8.0	-	Considerable.
2160 (1180)	Medium brownish-red (3YR-5/3)	2130	7.3 (12.3)	7.2	-	Some.

Remarks / Other Tests Firing range = Cone 1 to 5 and higher (commercial kiln = Cone 1 to 5). This shale is suitable for making brick and tile although the fired color is poor. However, this could be improved by blending with red-firing materials such as the clay tested under Fl.31S-7b (Smith, 1931, p. 92).

Preliminary Bloating (Quick Firing) Tests: Not determined.

Crushing Characteristics (unfired material) Easy grinding.

Particle Size -16 mesh. Retention Time Approx. 17 hours.

Chemical & Mineralogical Data:

Chemical Analysis

Oxide	Weight %
SiO_2	66.94
TiO_2	0.74
Al_2O_3	19.12
Fe_2O_3	2.84
FeO	-
MnO	-
MgO	0.23
CaO	trace
Na_2O	1.48
K_2O	1.36
P_2O_5	0.34
SO_3	trace
C (org.)	-
CO_2	-
H_2O^-	*
H_2O^+	-
Ignition loss	7.10
Total	100.15*

(* = analysis recalculated on an H_2O^- -free basis by Smith, 1931, p. 91.)

Mineralogy: Not determined.

Mineral	volume %
Quartz	
Feldspar	
Carbonate	
Mica	
Chlorite-vermiculite	
Montmorillonite	
Others	
Total	

Analyst E. Everhart, Ga. Geol. Survey.

Date c.1930.

Method Standard "wet".

Sample Location Data:

County Floyd. Land Lot 81 , Sec. 4 , Dist. 4 .

7 1/2' topo quad. Rock Mountain (cntr.). Lat. _____, Long. _____.

Field No. R-27 , Collected by R. W. Smith Date 3-1-29

Sample Method Grab samples. Weathering/alteration Weathered.

Structural Attitude Strike NE. - SW. and dip 75° SE.

Stratigraphic Assignment Floyd Shale (Mississippian).

Sample Description & Comments Samples from several shallow gullies near the S. side of the Central of Ga. RR. on the Levinson Property (South of Huffaker Rd.) 1 1/2 miles W. of Berryhill Station and 8 miles NW. of Rome. It is a soft, gray flaky shale and is overlain by 5 ft. of clay and gravel (not sampled). Samples collected by Smith (1931, p. 91-92) from 3 outcrops 15 ft. apart.

Compiled by B. J. O'Connor Date 2-10-86

CERAMIC TESTS AND ANALYSES

Material Mottled clay (Floyd Shale). Compilation Map Location No. F1.31S-10

County Floyd. Sample Number R-6

Raw Properties: Lab & No. Ga. Tech., #10.

Date Reported 1931. Ceramist R. W. Smith, Ga. Geol. Survey.

Water of Plasticity 27.0 % Working Properties Very good plasticity; rapid slaking; excellent molding behavior.

Color Light grayish-brown. Drying Shrinkage 6.0 % Dry Strength (MOR) 157.9 psi.

Remarks Drying Behavior: all test bars somewhat warped.

Slow Firing Tests:

Approx. Temp. °F (°C)	Color* (Munsell)	Hardness (MOR) psi.	Linear Shrinkage, % dry (plastic)	Absorption %	Appr. Por. %	Other data: Warpage
1840 (1005)	Salmon (5RY-7/5)	895	2.3 (8.7)	18.2	-	Some.
1920 (1050)	Salmon (3YR-6/5)	1235	3.6 (8.9)	16.7	-	Some.
2000 (1095)	Salmon (1YR-6/4)	1543	5.0 (10.2)	13.9	-	Some.
2060 (1125)	Salmon-red (2YR-6/4)	1837	6.3 (12.0)	10.3	-	Some.
2090 (1145)	Light red (10R-5/5)	1859	6.2 (11.8)	9.5	-	Some.
2160 (1180)	Fair red (10R-5/4)	2187	8.1 (13.3)	7.4	-	Considerable.

Remarks / Other Tests Firing Range = Cone 3 to 5 and higher. This clay was mined by the Oconee Clay & Shale Products Co. and blended with a residual clay from the Milledgeville area for structural and drain tile (Smith, 1931, p. 93 and p. 313; also Furcron, 1958, p. 5, No. 29 = F1.57-12).

Preliminary Bloating (Quick Firing) Tests: Not determined.

*Note: Munsell color notations "5YR" and "10R" correspond to the original notations "YR" and "R-YR" respectively reported in Smith (1931).

Crushing Characteristics (unfired material) Easy grinding.

Particle Size -16 mesh. Retention Time Approx. 17 hours.

Chemical & Mineralogical Data:

Chemical Analysis

Oxide	Weight %
SiO_2	60.39
TiO_2	1.09
Al_2O_3	24.38
Fe_2O_3	4.05
FeO	0.31
MnO	-
MgO	0.11
CaO	0.00
Na_2O	1.72
K_2O	1.32
P_2O_5	trace
SO_3	0.11
C (org.)	-
CO_2	-
H_2O^-	*
H_2O^+	-
Ignition loss	6.42
Total	99.90*

(* = analysis recalculated on an H_2O^- -free basis by Smith, 1931, p. 93).

Mineralogy: Not determined.

Mineral	volume %
Quartz	
Feldspar	
Carbonate	
Mica	
Chlorite-vermiculite	
Montmorillonite	
Others	
Total	

Analyst E. Everhart, Ga. Geol. Survey.

Date c.1930.

Method Standard "wet".

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. Rock Mountain (cntr.). Lat. _____, Long. _____.

Field No. R-6, Collected by R. W. Smith. Date 7-27-29

Sample Method 2 groove samples (from 2 places)

Weathering/alteration Residual clay (weathered shale)

Structural Attitude -

Stratigraphic Assignment Recent (?) residual clay from Floyd Shale (Mississippian).

Sample Description & Comments Samples from a clay pit (opened about early 1929) on the S. side of the Central of Ga. RR., 7/8 mile W. of Hillery Station, 1 3/8 mi. E. of Lavender Station and 9 mi. NW. of Rome. The pit (about 75 x 30 ft. and up to 15 ft. deep) shows a nearly structureless, mottled gray, brown and red soft clay grading into a soft, weathered, light gray clay or shale at the pit's bottom (Smith, 1931, p. 92-94; also see Fl.57-12 by Furcron, 1958, p. 5, No. 29).

Compiled by B.J. O'Connor Date 2-10-86

CERAMIC TESTS AND ANALYSES

Material Shale, brown and black (Floyd). Compilation Map Location No. F1.31S-11a

County Floyd. Sample Number R-7-A

Raw Properties: Lab & No. Ga. Tech., #11.

Date Reported 1931. Ceramist R. W. Smith, Ga. Geol. Survey.

Water of Plasticity 29.3 % Working Properties Good plasticity; rapid slaking; excellent molding behavior, but slightly laminated.

Color Light brown. Drying Shrinkage 6.5 % Dry Strength (MOR) 235.7 psi.

Remarks Drying Behavior: test bars all slightly warped.

Slow Firing Tests:

Approx. Temp. °F (°C)	Color* (Munsell)	Hardness (MOR) psi.	Linear Shrinkage, % dry (plastic)	Absorption %	Appr. Por. %	Other data: Warpage
1840 (1005)	Light red (5YR-6/7)	1803	4.9 (11.7)	14.8	-	Slight.
1920 (1050)	Fair red (10R-5/6)	1798	5.6 (12.2)	12.0	-	Slight.
2000 (1095)	Good red (10R-5/4)	1681	6.8 (13.0)	10.0	-	Slight.
2060 (1125)	Medium red (10R-5/6)	2278	7.4 (13.3)	9.2	-	Slight.
2090 (1145)	Dark red (10R-4/5)	2300	7.4 (13.1)	7.3	-	Slight.
2160 (1180)	Excellent dark red (10R-4/4)	2584	7.5 (13.6)	5.8	-	Slight.

Remarks / Other Tests Firing Range= Cone 04 to 5 (commercial kiln = Cone 04 to 3). Sample is suitable for making brick and tile, plus possibly sewer pipe and conduits. Slight lamination may have affected the green and fired strengths (MOR). All fired bars showed slight traces of scumming, but probably not enough to be of significance in commerical heavy clay products. (Smith, 1931, p. 96; also see Furcron, 1958, p. 5, No. 28 = F1.57-1 mined by Chattahoochee Brick Co.).

Preliminary Bloating (Quick Firing) Tests: Not determined.

*Note: Munsel color notations "5YR" and "10R" correspond to the original notations "YR" and "R-YR" respectively reported in Smith (1931).

Crushing Characteristics (unfired material) Easy grinding.

Particle Size -16 mesh. Retention Time Approx. 17 hours.

Chemical & Mineralogical Data:

Chemical Analysis

Oxide	Weight %
SiO_2	59.91
TiO_2	0.56
Al_2O_3	22.03
Fe_2O_3	7.50
FeO	0.32
MnO	0.00
MgO	trace
CaO	0.00
Na_2O	2.05
K_2O	0.76
P_2O_5	0.14
SO_3	0.00
C (org.)	-
CO_2	-
H_2O^-	*
H_2O^+	-
Ignition loss	7.50
Total	100.77*

(* = analysis recalculated on an H_2O^- -free basis by Smith, 1931, p. 95.)

Mineralogy: Not determined.

Mineral	volume %
Quartz	
Feldspar	
Carbonate	
Mica	
Chlorite-vermiculite	
Montmorillonite	
Others	
Total	

Analyst E. Everhart, Ga. Geol. Survey.

Date c.1930.

Method Standard "wet".

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. Rock Mountain (cntr.). Lat. _____, Long. _____.

Field No. R-7-A, Collected by R. W. Smith Date 7-27-29

Sample Method Grab samples. Weathering/alteration Weathered.

Structural Attitude Approximate strike N.60°E., dip 15°-20°SE. (somewhat uncertain due to slumping).

Stratigraphic Assignment Floyd Shale (Mississippian).

Sample Description & Comments Samples from the Long property (W. of Fl.31S-10) from cuts along Huffaker Rd. 1/4 to 3/8 mile E. of Lavender Station and about 1/8 mile N. of the Central of Ga. RR. The shale ranges from fissile and black (similar to Chattanooga shale) to fairly soft, waxy and brown (Smith, 1931, p. 94-96). It has subsequently been mined by the Chattahoochee Brick Co. (Furcron, 1958, p. 5, No. 28 - see Fl.57-1).

Compiled by B. J. O'Connor Date 2-10-86

CERAMIC TESTS AND ANALYSES

Material Shale, soft and dark (Floyd). Compilation Map Location No. F1.31S-11b

County Floyd. Sample Number R-7-B

Raw Properties: Lab & No. Ga. Tech., #11.

Date Reported 1931. Ceramist R. W. Smith, Ga. Geol. Survey.

Water of Plasticity 31.4 % Working Properties Good plasticity, sticky at first; rapid slaking; good molding behavior.

Color Grayish-brown. Drying Shrinkage 65% Dry Strength (MOR) 228.9 psi.

Remarks Drying Behavior: good, only slight warpage.

Slow Firing Tests:

Approx. Temp. °F (°C)	Color* (Munsell)	Hardness (MOR) psi.	Linear Shrinkage, % dry (plastic)	Absorption %	Appr. Por. %	Other data: Warpage
1840 (1005)	Salmon (6YR-7/5)	1483	4.3 (10.7)	19.1	-	Slight.
1920 (1050)	Salmon (3YR-6/6)	1739	5.1 (11.5)	16.1	-	Some.
2000 (1095)	Salmon (3YR-6/6)	2134	7.0 (12.9)	11.1	-	Slight.
2060 (1125)	Fair red (10R-5/6)	2639	8.8 (13.5)	7.5	-	Some.
2090 (1145)	Medium red (10R-5/5)	2375	8.6 (14.0)	7.4	-	Slight.
2160 (1180)	Dark brownish red (10R-4/4)	2784	9.9 (15.2)	4.4	-	Some to considerable.

Remarks / Other Tests Firing Range = Cone 1 to 5 (commercial kiln = Cone 02 to 4). The shale is suitable for making brick, tile and possibly sewer pipe (Smith, 1931, p. 98). Shale from this property was later mined by the Chattahoochee Brick Co. (Furcron, 1958, p. 5, No. 28 - see F1.57-1).

Preliminary Bloating (Quick Firing) Tests: Not determined.

*Note: Munsell color notation "10R" corresponds to the original notation "R-YR" reported in Smith (1931).

Crushing Characteristics (unfired material) Easy grinding.

Particle Size -16 mesh. Retention Time Approx. 17 hours.

Chemical & Mineralogical Data:

Chemical Analysis

Oxide	Weight %
SiO_2	58.28
TiO_2	0.74
Al_2O_3	17.18
Fe_2O_3	13.86
FeO	0.19
MnO	-
MgO	0.27
CaO	0.00
Na_2O	1.55
K_2O	1.21
P_2O_5	trace
SO_3	0.11
C (org.)	-
CO_2	-
H_2O^-	*
H_2O^+	-
Ignition loss	6.66
Total	100.05*

(* - analysis recalculated on an H_2O^- - basis by Smith, 1931, p. 96.)

Mineralogy: Not determined.

Mineral	volume %
Quartz	
Feldspar	
Carbonate	
Mica	
Chlorite-vermiculite	
Montmorillonite	
Others	
Total	

Analyst E. Everhart, Ga. Geol. Survey.

Date c.1930.

Method Standard "wet".

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. Rock Mountain (cntr.). Lat. _____, Long. _____.

Field No. R-7-B, Collected by R. W. Smith. Date 7-27-29

Sample Method Grab sample. Weathering/alteration Weathered.

Structural Attitude -

Stratigraphic Assignment Floyd Shale (Mississippian).

Sample Description & Comments Sample from cut on Huffaker Rd. beneath the Georgia Power Co. transmission lines about 1 1/4 miles E. of Lavender Stn. (Central of Ga. RR.) on the Long property, about 1/2 mile due N. of the Oconee Clay Products Co. clay pit (Fl.31S-10) and W. of 31S-9. Soft, dark gray to chocolate brown shale weathering into layers 1/4 to 1 in. thick and with a waxy luster on knife-cut surfaces (Smith, 1931, p. 94-98). (Shale was later mined in this area by the Chattahoochee Brick Co., Furcron, 1958, No. 28, p. 5 - see Fl.57-1.)

Compiled by B. J. O'Connor Date 2-10-86

CERAMIC TESTS AND ANALYSES

Material Shale, soft (Floyd). Compilation Map Location No. F1.31S-12

County Floyd. Sample Number R-10

Raw Properties: Lab & No. Ga. Tech., #12.

Date Reported 1931. Ceramist R. W. Smith, Ga. Geol. Survey.

Water of Plasticity 32.4 % Working Properties Good plasticity; rapid slaking; and good molding behavior.

Color Yellowish-brown. Drying Shrinkage 5.4 % Dry Strength (MOR) 148.5 psi.

Remarks Drying Behavior: good, very little warpage.

Slow Firing Tests:

Approx. Temp. °F (°C)	Color* (Munsell)	Hardness (MOR) psi.	Linear Shrinkage, % dry (plastic)	Absorption %	Appr. Por. %	Other data: Warpage
1840 (1005)	Salmon (5YR-6/6)	742	3.2 (8.5)	21.6	-	Slight.
1920 (1050)	Light red (2YR-6/5)	799	4.0 (9.4)	20.2	-	Slight.
2000 (1095)	Light red (3YR-6/5)	1065	5.8 (11.1)	16.8	-	Slight.
2060 (1125)	Medium red (10R-5/5)	1478	7.6 (12.7)	12.8	-	Slight.
2090 (1145)	Good red (10R-5/4)	1707	7.2 (11.9)	12.5	-	Slight.
2160 (1180)	Good red (10R-4/4)	1698	8.0 (12.8)	11.6	-	Slight.

Remarks / Other Tests Firing Range = Cone 1 to 5 and higher (commercial kiln = Cone 02 to 5). This shale is suitable for brick and medium-fired structural tile (Smith, 1931, p. 101; also Furcron, 1958, p. 5, No. 31-no further ceramic tests).

Preliminary Bloating (Quick Firing) Tests: Not determined.

*Note: Munsell color notations "5YR" and "10R" correspond to the original notations "YR" and "R-YR" respectively reported in Smith (1931).

Crushing Characteristics (unfired material) Easy grinding.

Particle Size -16 mesh. Retention Time Approx. 17 hours.

Chemical & Mineralogical Data:

Chemical Analysis

Oxide	Weight %
SiO_2	57.43
TiO_2	0.56
Al_2O_3	21.17
Fe_2O_3	9.36
FeO	0.00
MnO	0.58
MgO	1.94
CaO	0.00
Na_2O	0.75
K_2O	0.48
P_2O_5	0.53
SO_3	0.28
C (org.)	-
CO_2	-
H_2O^-	*
H_2O^+	-
Ignition loss	6.99
Total	100.07*

(* = analysis recalculated on an H_2O^- -free basis by Smith, 1931, p. 100.)

Mineralogy: Not determined.

Mineral	volume %
Quartz	
Feldspar	
Carbonate	
Mica	
Chlorite-vermiculite	
Montmorillonite	
Others	
Total	

Analyst E. Everhart, Ga. Geol. Survey.

Date c.1930.

Method Standard "wet".

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. Rock Mountain (SE. 1/4). Lat. _____, Long. _____.

Field No. R-10, Collected by R.W. Smith. Date 7-29-29

Sample Method Grab samples from new 28 ft. water well. Weathering/alteration Weathered.

Structural Attitude Near the trace of the Rome fault.

Stratigraphic Assignment Floyd Shale (Mississippian) near fault contact with Conasauga shales (Cambrian).

Sample Description & Comments Samples of soft, plastic, yellowish-brown shale which breaks into small waxy flakes - in lower 20 ft. of well beneath 8 ft. of soil and sub-soil containing rounded gravel. (Semi-hard, drab-colored shale also crops out along the nearby low ridge.) Located on the J. L. Johnson property (former Barry Wright place) S. of the Southern RR., about 7 1/2 mi. W. of Rome approximately half way between Robinson (on the E.) and Oreburg (on the W.) (Smith, 1931, p. 99-101; also Furcron, 1958, p. 5., No. 31, Dr. T.Harbin property - no further ceramic tests).

Compiled by B. J. O'Connor Date 2-10-86

CERAMIC TESTS AND ANALYSES

Material Shale, soft (Conasauga). Compilation Map Location No. F1.31S-13

County Floyd. Sample Number R-8

Raw Properties: Lab & No. Ga. Tech., #13

Date Reported 1931. Ceramist R. W. Smith, Ga. Geol. Survey.

Water of Plasticity 34.6 % Working Properties Good plasticity; rapid slaking; good molding behavior.

Color Reddish-brown. Drying Shrinkage 6.9 % Dry Strength (MOR) 208.9 psi.

Remarks Drying Behavior: All test bars slightly warped.

Slow Firing Tests:

Approx. Temp. °F (°C)	Color* (Munsell)	Hardness (MOR) psi.	Linear Shrinkage, % dry (plastic)	Absorption %	Appr. Por. %	Other data: Warpage
1840 (1005)	Salmon (4YR-6/7)	997	4.1 (10.4)	20.3	-	Slight.
1920 (1050)	Salmon red (2YR-6/8)	1249	5.7 (11.5)	16.9	-	Some.
2000 (1095)	Light red (10R-5/7)	1542	6.3 (14.0)	13.6	-	Very slight.
2060 (1125)	Good red (10R-5/6)	2197	10.4 (16.0)	8.1	-	Some.
2090 (1145)	Dark red (10R-4/5)	1849	9.2 (14.9)	8.5	-	Considerable.
2160 (1180)	Dark brownish red (10R-4/4)	2053	10.3 (16.5)	6.7	-	Some to considerable.

Remarks / Other Tests Firing Range = Cone (commercial kiln = Cone 01 to 4). This shale should be satisfactory for making bricks and possibly structural tile and sewer pipe although the shrinkage is high. Shrinkage might be reduced by blending with a harder or more siliceous shale (Smith, 1931, p. 103; also Furcron, 1958, p. 5, No. 30 - no further ceramic tests).

Preliminary Bloating (Quick Firing) Tests: Not determined.

*Note: Munsell color notation "10R" corresponds to the original notation "R-YR" reported in Smith (1931).

Crushing Characteristics (unfired material) Easy grinding.

Particle Size -16 mesh. Retention Time Approx. 17 hours.

Chemical & Mineralogical Data:

Chemical Analysis

Oxide	Weight %
SiO_2	63.01
TiO_2	0.56
Al_2O_3	17.76
Fe_2O_3	6.85
FeO	0.79
MnO	0.00
MgO	0.23
CaO	0.00
Na_2O	0.92
K_2O	0.83
P_2O_5	0.19
SO_3	0.24
C (org.)	-
CO_2	-
H_2O^-	*
H_2O^+	-
Ignition loss	8.72
Total	100.10*

(* = analysis recalculated on an H_2O^- -free basis by Smith, 1931, p. 102.)

Mineralogy: Not determined.

Mineral	volume %
Quartz	
Feldspar	
Carbonate	
Mica	
Chlorite-vermiculite	
Montmorillonite	
Others	
Total	

Analyst E. Everhart, Ga. Geol. Survey.

Date c.1930.

Method Standard "wet".

Sample Location Data:

County Floyd. Land Lot 186, Sec. 4, Dist. 4.

7 1/2' topo quad. Rock Mountain (S. edge) . Lat. _____, Long. _____.

Field No. R-8, Collected by R. W. Smith. Date 7-29-29

Sample Method Grab samples. Weathering/alteration Weathered.

Structural Attitude -

Stratigraphic Assignment Conasauga Group shale (Cambrian).

Sample Description & Comments Sample soft, plastic, brownish-red shale (3 ft. exposed) under 5 ft. of silt and gravel overburden. Shale exposed in a gulley on the north ridge-slope. Located on the J. Martin property on the S. side of the Southern RR. just W. of Oreburg station (Smith, 1931, p. 101-103; also Furcron, 1958, P. 5, No. 30 - no further ceramic tests).

Compiled by B. J. O'Connor Date 2-10-86

CERAMIC TESTS AND ANALYSES

Material Shale, soft (Conasauga). Compilation Map Location No. F1.31S-14

County Floyd. Sample Number R-53

Raw Properties: Lab & No. Ga. Tech., #14.

Date Reported 1931. Ceramist R. W. Smith, Ga. Geol. Survey.

Water of Plasticity 27.4 % Working Properties Plasticity is a little grainy at first, good after aging overnight; fairly rapid slaking; good molding behavior.

Color Light grayish-brown. Drying Shrinkage 5.0 % Dry Strength (MOR) 153.2 psi.

Remarks Drying Behavior: good.

Slow Firing Tests:

Approx. Temp. °F (°C)	Color (Munsell)	Hardness (MOR) psi.	Linear Shrinkage, % dry (plastic)	Absorption %	Appr. Por. %	Other data: Warpage
1840 (1005)	Dark salmon (1YR-6/8)	1259	5.4 (10.3)	12.0	-	Slight.
1920 (1050)	Light red (1YR-5/7)	1463	5.8 (10.5)	10.3	-	Slight.
2000 (1095)	Medium red (1YR-5/5)	2060	6.6 (11.3)	7.2	-	Slight.
2060 (1125)	Good red (1YR-4/4)	2589	9.1 (13.6)	3.8	-	Some.
2090 (1145)	Deep chocolate red (2YR-3/5)	1839	7.0 (11.5)	3.1	-	Bad.
2160 (1180)	Deep chocolate (2YR-3/3)	2570	6.7 (11.4)	2.1	-	Considerable.

Remarks / Other Tests Firing Range = Cone 1 to 5 (Commercial kiln = Cone 02 to 4). The shale is suitable for making brick - possibly for tile and sewer pipe (Smith, 1931, p. 106; also Furcron, 1958, No. 34, p.6 - see F1.57-15).

Preliminary Bloating (Quick Firing) Tests: Not determined.

Crushing Characteristics (unfired material) Fairly easy grinding, brittle.

Particle Size -16 mesh. Retention Time Approx. 17 hours.

Chemical & Mineralogical Data:

Chemical Analysis

Oxide	Weight %
SiO_2	55.43
TiO_2	0.81
Al_2O_3	27.56
Fe_2O_3	5.91
FeO	-
MnO	-
MgO	trace
CaO	0.00
Na_2O	0.72
K_2O	1.63
P_2O_5	trace
SO_3	0.00
C (org.)	-
CO_2	-
H_2O^-	*
H_2O^+	-
Ignition loss	7.89
Total	99.95*

(* = analysis recalculated on an H_2O^- -free basis by Smith, 1931, p. 104.)

Mineralogy: Not determined.

Mineral	volume %
Quartz	
Feldspar	
Carbonate	
Mica	
Chlorite-vermiculite	
Montmorillonite	
Others	
Total	

Analyst E. Everhart, Ga. Geol. Survey.

Date c.1930.

Method Standard "wet".

Sample Location Data:

County Floyd Land Lot 101, Sec. 4, Dist. 15.

7 1/2' topo quad. Chattoogaville (SE. 1/4). Lat. , Long. .

Field No. R-53, Collected by R. W. Smith. Date 8-14-29

Sample Method Grab samples. Weathering/alteration Weathered.

Structural Attitude Strike N. 70° W., dip 45°N.

Stratigraphic Assignment Conasauga Group shale (Cambrian).

Sample Description & Comments Samples of soft, olive-green to drab shale (flaky-weathering in places and splintery in others) from cuts on the "road from Lavender Station to Early Station" (= present Ga. Hwy. 20 ?) on the slope E. of King Creek. The road forms the boundary between the C. Evans property on the N. and the G. Russell property on the S. (Smith, 1931, p. 103-106)-corresponding to the W. E. Bridges and D. Davis properties respectively of Furcron (1958, p. 6, No. 34 - see Fl.57-15).

Compiled by B. J. O'Connor Date 2-10-86

CERAMIC TESTS AND ANALYSES

Material Shale, soft (Conasauga). Compilation Map Location No. F1.31S-15

County Floyd. Sample Number R-37

Raw Properties: Lab & No. Ga. Tech., #15.

Date Reported 1931. Ceramist R. W. Smith, Ga. Geol. Survey.

Water of Plasticity 26.8 % Working Properties Good plasticity; fairly rapid slaking; good molding behavior.

Color Brownish-drab. Drying Shrinkage 4.5 % Dry Strength (MOR) 171.2 psi.

Remarks Drying Behavior: All test bars slightly warped.

Slow Firing Tests:

Approx. Temp. °F (°C)	Color* (Munsell)	Hardness (MOR) psi.	Linear Shrinkage, % dry (plastic)	Absorption %	Appr. Por. %	Other data: Warpage
1840 (1005)	Salmon (3YR-6/7)	701	3.5 (7.9)	16.8	-	Slight.
1920 (1050)	Light red (10R-5/5)	1107	4.4 (8.5)	14.1	-	Slight.
2000 (1095)	Medium red (10R-5/3)	1318	5.4 (9.7)	12.9	-	Slight.
2060 (1125)	Fair red (10R-5/4)	1636	6.8 (10.8)	10.5	-	Slight.
2090 (1145)	Deep red (10R-4/5)	2032	7.4 (11.7)	7.3	-	Considerable.
2160 (1180)	Very deep red (8R-4/3)	2203	8.4 (12.5)	6.4	-	Some.

Remarks / Other Tests Firing Range = Cone 1 to 5 and higher (commercial kiln = Cone 02 to 05). This shale is suitable for the manufacture of brick and possibly tile and sewer pipe (Smith, 1931, p. 108; also Furcron, 1958, p. 6, No. 32. - no further ceramic tests).

Preliminary Bloating (Quick Firing) Tests: Not determined.

*Note: Munsell color notation "10R" corresponds to the original notation "R-YR" reported in Smith (1931).

Crushing Characteristics (unfired material) Fairly easy grinding, brittle.

Particle Size -16 mesh. Retention Time Approx. 17 hours.

Chemical & Mineralogical Data:

Chemical Analysis

Oxide	Weight %
SiO_2	60.92
TiO_2	0.93
Al_2O_3	20.84
Fe_2O_3	7.32
FeO	0.64
MnO	-
MgO	0.04
CaO	0.48
Na_2O	trace
K_2O	1.24
P_2O_5	0.12
SO_3	0.24
C (org.)	-
CO_2	-
H_2O^-	*
H_2O^+	-
Ignition loss	7.18
Total	99.95*

(* = analysis recalculated on an H_2O^- -free basis by Smith, 1931, p. 107.)

Mineralogy: Not determined.

Mineral	volume %
Quartz	
Feldspar	
Carbonate	
Mica	
Chlorite-vermiculite	
Montmorillonite	
Others	
Total	

Analyst E. Everhart, Ga. Geol. Survey.

Date c.1930.

Method Standard "wet".

Sample Location Data:

County Floyd. Land Lot 286, Sec. 4, Dist. 4.

7 1/2' topo quad. Livingston (NW. 1/4). Lat. _____, Long. _____.

Field No. R-37, Collected by R. W. Smith Date 8-6-29

Sample Method Grab sample. Weathering/alteration Weathered.

Structural Attitude -

Stratigraphic Assignment Conasauga Group shale (Cambrian).

Sample Description & Comments Soft, olive-green shale which breaks into thin, flat pieces and flakes with a waxy luster - about 50 ft. thick exposure on the S. bank of the Coosa River at Turner Bend, 10 miles (airline) W. of Rome. No limestone is visible in the shale, but a lense of massive limestone underlies it near the shore line. This outcrop is near the line between the J. B. Williams and L. N. Cooper properties (Smith, 1931, p. 106 to 108; also Furcron, 1958, p. 6, No. 32 - no further ceramic tests).

Compiled by B. J. O'Connor Date 2-10-86

CERAMIC TESTS AND ANALYSES

Material Shale, hard to semi-hard (Conasauga). Compilation Map Location No. F1.31S-16

County Floyd. Sample Number R-30

Raw Properties: Lab & No. Ga. Tech., #16.

Date Reported 1931. Ceramist R. W. Smith, Ga. Geol. Survey.

Water of Plasticity 20.7 % Working Properties Poor and grainy plasticity, even on aging a week; slow slaking; poor molding behavior (bars swelled and cracked).

Color Light brown. Drying Shrinkage 2.0 % Dry Strength (MOR) 75.1 psi.

Remarks Drying Behavior: Test bars show slight warpage.

Slow Firing Tests:

Approx. Temp. °F (°C)	Color* (Munsell)	Hardness (MOR) psi.	Linear Shrinkage, % dry (plastic)	Absorption %	Appr. Por. %	Other data: Warpage
1840 (1005)	Light red (2YR-6/7)	1879	4.8 (6.7)	9.7	-	Slight.
1920 (1050)	*	*	* *	6.9	-	*
2000 (1095)	Medium red (10R-5/5)	2383	4.6 (6.4)	7.2	-	Some.
2060 (1125)	Good red (10R-4/4)	2534	6.8 (8.7)	4.9	-	Considerable.
2090 (1145)	Deep brownish red (10R-3/5)	2034	6.4 (7.8)	1.9	-	Bad.
2160 (1180)	Deep brownish red (10R-3/4)	2934	8.2 (10.0)	2.4	-	Bad.

(* = all test bars broke in handling.)

Remarks / Other Tests Firing range = Cone 06 to 3 (commercial kiln = Cone 06 - 1). Shale is usable for making brick and possible structural tile. The poor working properties might be overcome by using hot water, finer grinding and/or longer pugging (Smith, 1931, p. 109 and 110). A glassy and vesicular structure began to develop at relatively low temperatures (approx. 2090-2160°F) indicating it might be used for expanded aggregate production.

Preliminary Bloating (Quick Firing) Tests: Not determined.

*Note: Munsell color notation "10R" corresponds to the original notation "R-YR" reported in Smith (1931).

Crushing Characteristics (unfired material) Fairly easy grinding, brittle.

Particle Size -16 mesh. Retention Time Approx. 17 hours.

Chemical & Mineralogical Data:

Chemical Analysis

Oxide	Weight %
SiO_2	55.94
TiO_2	0.55
Al_2O_3	24.92
Fe_2O_3	7.80
FeO	-
MnO	-
MgO	0.13
CaO	0.00
Na_2O	1.17
K_2O	1.94
P_2O_5	0.26
SO_3	0.59
C (org.)	-
CO_2	-
H_2O^-	*
H_2O^+	-
Ignition loss	6.76
Total	100.06

(* = analysis recalculated on an H_2O^- -free basis by Smith, 1931, p. 109.)

Mineralogy: Not determined.

Mineral	volume %
Quartz	
Feldspar	
Carbonate	
Mica	
Chlorite-vermiculite	
Montmorillonite	
Others	
Total	

Analyst E. Everhart, Ga. Geol. Survey.

Date c.1930.

Method Standard "wet".

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. Rome South (cntr.). Lat. _____, Long. _____.

Field No. R-30, Collected by R. W. Smith. Date 8-2-29

Sample Method Grooves (6 and 3 ft.) + grab sample composite. Weathering/alteration Little weathered.

Structural Attitude Apparent strike N.25°E., dip approx. 65°E. -- variable.

Stratigraphic Assignment Conasauga Group (Cambrian) shale.

Sample Description & Comments Semi-hard to hard, greenish-drab to brown shale from about a 500 ft. long cut along US 411-Ga. Hwy. 53, 1/2 mile N. of Six Mile Station, about 1/4 mi. W. of the Southern RR., about 5 1/2 miles SW. of Rome, on the P. M. Foster property. The samples are of somewhat fissile shale from the N. end (3 ft. groove) and S. end (6 ft. groove) and a grab sample, from the middle, of harder, less fissile shale which appears more siliceous (less weathered ?) (Smith, 1931, p. 108 to 110.)

Compiled by B. J. O'Connor Date 2-10-86

CERAMIC TESTS AND ANALYSES

Material Shale, hard to semi-hard (Conasauga). Compilation Map of Location No. F1.31S-17

County Floyd. Sample Number R-48

Raw Properties: Lab & No. Ga. Tech., #17.

Date Reported 1931. Ceramist R. W. Smith, Ga. Geol. Survey.

Water of Plasticity 24.1 % Working Properties Very poor plasticity, even on aging a week; very slow slaking; poor molding behavior (bars swell, tear, and crack on edges).

Color Light brownish-gray Drying Shrinkage 3.6 % Dry Strength (MOR) 44.3 psi.

Remarks Drying Behavior: All test bars somewhat warped.

Slow Firing Tests:

Approx. Temp. °F (°C)	Color* (Munsell)	Hardness (MOR) psi.	Linear Shrinkage, % dry (plastic)	Absorption %	Appr. Por. %	Other data: Warpage
1840 (1005)	Dark salmon (3YR-6/8)	726	3.3 (6.7)	14.2	-	Some.
1920 (1050)	Light red (1YR-5/5)	1588	5.0 (8.5)	9.8	-	Considerable.
2000 (1095)	Medium red (2YR-5/6)	1260	5.0 (8.2)	10.3	-	Considerable.
2060 (1125)	Medium red (1YR-5/5)	1773	5.5 (8.8)	9.0	-	Considerable.
2090 (1145)	Good red (10R-4/4)	1809	5.9 (9.3)	5.2	-	Bad.
2160 (1180)	Deep brownish red (10R-3/4)	2547	7.3 (11.2)	2.3	-	Bad (slight vitrification on broken ends)

Remarks / Other Tests Firing Range = Cone 02 to 3 (commercial kiln = Cone 04 to 2). The shale is satisfactory for brick if working properties could be improved-perhaps by finer grinding, longer pugging and/or use of hot water and electrolites (Smith, 1931, p. 112). Glassy structure at the comparatively low temperature (approx. 2160°F, 1180°C) indicates that this shale might have advantages for making lightweight, expanded aggregate.

Preliminary Bloating (Quick Firing) Tests: Not determined.

*Note: Munsell color notation "10R" corresponds to the original notation "R-YR" in Smith (1931).

Crushing Characteristics (unfired material): Fairly easy grinding, brittle.

Particle Size -16 mesh. Retention Time Approx. 17 hours.

Chemical & Mineralogical Data:

Chemical Analysis

Oxide	Weight %
SiO_2	56.32
TiO_2	1.09
Al_2O_3	26.34
Fe_2O_3	6.45
FeO	-
MnO	-
MgO	trace
CaO	0.00
Na_2O	0.90
K_2O	2.72
P_2O_5	trace
SO_3	0.00
CO_2	-
H_2O^-	*
H_2O^+	-
Ignition loss	6.12
Total	99.94*

(* = analysis recalculated on an H_2O^- -free basis by Smith, 1931, p. 111.)

Mineralogy: Not determined.

Mineral	volume %
Quartz	
Feldspar	
Carbonate	
Mica	
Chlorite-vermiculite	
Montmorillonite	
Others	
Total	

Analyst E. Everhart, Ga. Geol. Survey.

Date 1931.

Method Standard "wet".

Sample Location Data:

County Floyd. Land Lot 324 , Sec. 3 , Dist. 23 .

7 1/2' topo quad. Rome South (NE. 1/4) . Lat. _____, Long. _____.

Field No. R-48 , Collected by R. W. Smith. Date 8-8-29

Sample Method Grab. Weathering/alteration -

Structural Attitude Beds strike N.20°E. and dip about 90°E.

Stratigraphic Assignment Conasauga Group shale (Cambrian).

Sample Description & Comments Shale is from outcrops of semi-hard to hard, greenish-drab Conasauga shale weathering into small flat pieces and long splinters. Located on a low ridge between the Southern RR. and Silver Creek (on the west) on the J. M. Graham property 1-1/2 miles S. of Rome and just N. of New Rome (Smith, 1931, p. 111-112.

Compiled by B. J. O'Connor Date 2-10-86

CERAMIC TESTS AND ANALYSES

Material Shale, soft (Conasauga). Compilation Map Location No. Fl. 31S-18a

County Floyd. Sample Number R-32-A

Raw Properties: Lab & No. Ga. Tech., #18.

Date Reported 1931. Ceramist R. W. Smith, Ga. Geol. Survey.

Water of Plasticity 27.2 % Working Properties Fair plasticity, a little "short"; rapid slaking; fair molding behavior (clay column tore some at edges and broke easily).

Color Brownish-tan Drying Shrinkage 3.1 % Dry Strength (MOR) 62.0 psi.

Remarks Drying Behavior: Test bars all slightly warped.

Slow Firing Tests:

Approx. Temp. °F (°C)	Color* (Munsell)	Hardness (MOR) psi.	Linear Shrinkage, % dry (plastic)	Absorption %	Appr. Por. %	Other data: Warpage
1840 (1005)	Salmon (4YR-6/6)	992	5.0 (7.8)	15.7	-	Slight.
1920 (1050)	Salmon (2YR-5/5)	1122	4.8 (7.7)	15.7	-	Slight.
2000 (1095)	Dark salmon (2YR-6/5)	1423	5.9 (8.7)	12.9	-	Some.
2060 (1125)	Fair red (10R-4/4)	1958	8.8 (11.5)	8.8	-	Some.
2090 (1145)	Good red (10R-4/3)	2342	9.9 (12.9)	5.8	-	Considerable.
2160 (1180)	Deep chocolate red (10R-3/3)	2775	10.9 (13.8)	2.8	-	Considerable.

Remarks / Other Tests Firing Range = Cone 01 to 5 (commercial kiln =Cone 02 to 4). Used by the B. M. Hood Co. (blended with alluvial clay - 18b) to manufacture roofing tile beginning in 1925. Previously used by the Rome Brick Co. (also blended with alluvial clay) to manufacture common and pressed brick (Smith, 1931, p. 112-113).

Preliminary Bloating (Quick Firing) Tests: Not determined.

*Note: Munsell color notation "10R" corresponds to the original notation "R-YR" reported in Smith (1931).

Crushing Characteristics (unfired material) Easy grinding.

Particle Size -16 mesh. Retention Time Approx. 17 hours.

Chemical & Mineralogical Data:

Chemical Analysis

Oxide	Weight %
SiO_2	62.20
TiO_2	0.37
Al_2O_3	18.65
Fe_2O_3	9.07
FeO	-
MnO	-
MgO	0.14
CaO	0.00
Na_2O	1.55
K_2O	1.66
P_2O_5	trace
SO_3	0.52
C (org.)	-
CO_2	-
H_2O^-	*
H_2O^+	-
Ignition loss	5.83
Total	99.99*

(* = analysis recalculated on an H_2O^- -free basis by Smith, 1931, p. 113.)

Mineralogy: Not determined.

Mineral	volume %
Quartz	
Feldspar	
Carbonate	
Mica	
Chlorite-vermiculite	
Montmorillonite	
Others	
Total	

Analyst E. Everhart, Ga. Geol. Survey.

Date c.1930.

Method Standard "wet".

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. Rome North (SE. 1/4). Lat. _____, Long. _____.

Field No. R-32-A, Collected by R. W. Smith Date 8-3-29

Sample Method Grab from stockpile. Weathering/alteration Weathered.

Structural Attitude Strike N.30°E., dip about 90°E.

Stratigraphic Assignment Conasauga Group (Cambrian).

Sample Description & Comments Stockpile sample of soft, brownish-drab shale mined from the shale pit (about 100 x 75 ft. and 25 ft. deep) just east of the B. M. Hood Co. roofing tile plant in North Rome--exact location unspecified (Smith, 1931, p. 112 to 113). (Shale in the pit is overlain by 5 to 15 ft. of alluvial and colluvial overburden of weathered shale and clay as well as terrace silt and gravel--none of which was used in the tile plant.)

Compiled by B. J. O'Connor Date 2-10-86

CERAMIC TESTS AND ANALYSES

Material Clay, plastic (alluvial). Compilation Map Location No. F1.31S-18b

County Floyd. Sample Number R-32-B

Raw Properties: Lab & No. Ga. Tech., #18.

Date Reported 1931. Ceramist R. W. Smith, Ga. Geol. Survey.

Water of Plasticity 26.4 % Working Properties Good plasticity; rapid slaking; excellent molding behavior.

Color Dark buff. Drying Shrinkage 8.1 % Dry Strength (MOR) 344.2 psi.

Remarks Drying Behavior: Good, very little warpage.

Slow Firing Tests:

Aprox. Temp. °F (°C)	Color* (Munsell)	Hardness (MOR) psi.	Linear Shrinkage, % dry (plastic)	Absorption %	Appr. Por. %	Other data: Warpage
1840 (1005)	Light salmon (5YR-7/6)	1140	2.0 (10.1)	16.2	-	Very slight.
1920 (1050)	Salmon (4YR-6/6)	1227	2.0 (9.9)	15.1	-	Slight.
2000 (1095)	Dark salmon (1YR-6/5)	1260	3.5 (11.3)	12.7	-	Very slight.
2060 (1125)	Light red (2YR-5/5)	1346	4.2 (12.2)	12.4	-	Very slight.
2090 (1145)	Medium light red (1YR-5/6)	1388	3.0 (10.4)	12.5	-	Slight.
2160 (1180)	Medium red (1YR-5/4)	1385	4.1 (11.9)	11.2	-	Slight.

Remarks / Other Tests Firing Range = Cone 02 to 5 and higher (commercial kiln = Cone 01 to 5 and higher). Used by the B. M. Hood Co. (blended with Conasauga shale) in making roofing tile (beginning in 1925); and used earlier by Rome Brick Co. (also blended with shale) in making common and pressed brick (Smith, 1931, p. 112-116).

Preliminary Bloating (Quick Firing) Tests: Not determined.

*Note: Munsell color notation "5RY" corresponds to the original notation "YR" reported in Smith (1931).

Crushing Characteristics (unfired material) Easy grinding.

Particle Size -16 mesh. Retention Time Approx. 17 hours.

Chemical & Mineralogical Data:

Chemical Analysis

Oxide	Weight %
SiO_2	63.95
TiO_2	0.46
Al_2O_3	19.68
Fe_2O_3	5.50
FeO	-
MnO	-
MgO	0.23
CaO	0.10
Na_2O	1.18
K_2O	0.78
P_2O_5	trace
SO_3	0.35
C (org.)	-
CO_2	-
H_2O^-	*
H_2O^+	-
Ignition loss	7.68
Total	99.91*

(* = analysis recalculated on an H_2O^- -free basis by Smith, 1931, p. 114.)

Mineralogy: Not determined.

Mineral	volume %
Quartz	
Feldspar	
Carbonate	
Mica	
Chlorite-vermiculite	
Montmorillonite	
Others	
Total	

Analyst E. Everhart, Ga. Geol. Survey.

Date c.1930.

Method Standard "wet".

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. Rome North (SE. 1/4). Lat. _____, Long. _____.

Field No. R-32-B, Collected by R. W. Smith. Date 8-3-29

Sample Method Grab-from stockpile. Weathering/alteration -

Structural Attitude -

Stratigraphic Assignment Recent (?) alluvial terrace deposits above the Etowah River.

Sample Description & Comments Sample of plastic, blue to brown alluvial clay with "more or less" fine sand and some fine mica from pit beneath about 8 in. of soil overburden. Pit located S. of the B. M. Hood Co. roofing tile plant in North Rome--exact location unspecified (Smith, 1931, p. 112, 114 - 116).

Compiled by B. J. O'Connor Date 2-10-86

CERAMIC TESTS AND ANALYSES

Material Shale, hard (Conasauga). Compilation Map Location No. F1.31S-19

County Floyd. Sample Number R-41

Raw Properties: Lab & No. Ga. Tech., #19.

Date Reported 1931. Ceramist R. W. Smith, Ga. Geol. Survey.

Water of Plasticity - % Working Properties Very poor plasticity, even after aging a week; very slow slaking; and very poor molding behavior.

Color Reddish-brown. Drying Shrinkage - % Dry Strength -

Slow Firing Tests: Not determined due to very poor working properties.

Temp. °F (°C)	Color	Hardness	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data:

Remarks / Other Tests This shale "Had so little plasticity that the sample was discarded without further tests." This indicates that the shale, by itself, is not suitable for making heavy clay products. However, it might be usable for light-weight aggregate manufacture (Smith, 1931, p. 117 and 118).

Preliminary Bloating (Quick Firing) Tests: Not determined.

Crushing Characteristics (unfired material) Fairly easy grinding, brittle.

Particle Size -16 mesh. Retention Time -

Chemical & Mineralogical Data:

Chemical Analysis

Oxide	Weight %
SiO_2	54.04
TiO_2	0.90
Al_2O_3	26.10
Fe_2O_3	9.50
FeO	0.76
MnO	-
MgO	trace
CaO	0.00
Na_2O	0.10
K_2O	2.31
P_2O_5	0.20
SO_3	0.17
C (org.)	-
CO_2	-
H_2O^-	*
H_2O^+	-
Ignition loss	5.85
Total	99.93*

(* = analysis recalculated on an H_2O^- -free basis by Smith, 1931, -. 117.)

Mineralogy: Not determined.

Mineral	volume %
Quartz	
Feldspar	
Carbonate	
Mica	
Chlorite-vermiculite	
Montmorillonite	
Others	
Total	

Analyst E. Everhart, Ga. Geol. Survey

Date c.1930.

Method Standard "wet".

Sample Location Data:

County Floyd Land Lot 256 and 257, Sec. 3, Dist. 24.

7 1/2' topo quad. Shannon (N. side). Lat. _____, Long. _____.

Field No. R-41, Collected by R. W. Smith Date 8-7-29

Sample Method Grab samples. Weathering/alteration Some weathering.

Structural Attitude Beds strike N.45°E. and dip approx. 65°SE.

Stratigraphic Assignment Conasauga Group (Cambrian).

Sample Description & Comments Samples of hard, brownish-red shale, locally weathered into slabs 1 to 2 in. thick, from cuts along the Southern RR., N. of Pinson Station, over a total distance of about 1/4 mile. Samples at both ends of the W. T. Watters property, on the west side of the RR., 10 miles NE. of Rome (Smith, 1931, p. 117 and 118). This was described as the Bill McKeller property by Furcron (1958, p. 4, No. 19).

Compiled by B. J. O'Connor Date 2-10-86

CERAMIC TESTS AND ANALYSES

Material Shale, hard (Conasauga). Compilation Map Location No. Fl.31S-20

County Floyd. Sample Number R-20

Raw Properties: Lab & No. Ga. Tech., #20.

Date Reported 1931. Ceramist R. W. Smith, Ga. Geol. Survey.

Water of Plasticity - % Working Properties Very poor plasticity, even after aging a week; very slow slaking; and very poor molding behavior.

Color Reddish-brown. Drying Shrinkage - % Dry Strength -

Slow Firing Tests: Not determined due to very poor working properties.

Temp. °F (°C)	Color	Hardness	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data:

Remarks / Other Tests This shale "had so little plasticity that the sample was discarded without further tests." --indicating that, by itself, the shale is not suitable for making heavy clay products. In 1928-1929 this property was optioned and prospected for light-weight aggregate manufacture, and the shale was reported to have been found satisfactory (Smith, 1931, p. 118).

Preliminary Bloating (Quick Firing) Tests: Not determined.

Crushing Characteristics (unfired material) Fairly easy grinding, brittle.

Particle Size -16 mesh. Retention Time -

Chemical & Mineralogical Data:

Chemical Analysis

Oxide	Weight %
SiO_2	60.67
TiO_2	0.54
Al_2O_3	22.05
Fe_2O_3	7.62
FeO	0.00
MnO	0.43
MgO	0.20
CaO	0.00
Na_2O	0.76
K_2O	1.85
P_2O_5	0.13
SO_3	0.12
C (org.)	-
CO_2	-
H_2O^-	*
H_2O^+	-
Ignition loss	5.32
Total	99.69*

(* = analysis recalculated on an H_2O^- -free basis by Smith, 1931, p. 118.)

Mineralogy: Not determined.

Mineral	volume %
Quartz	
Feldspar	
Carbonate	
Mica	
Chlorite-vermiculite	
Montmorillonite	
Others	
Total	

Analyst E. Everhart, Ga. Geol. Survey.

Date c.1930.

Method Standard "wet".

Sample Location Data:

County Floyd. Land Lot 257, Sec. 3, Dist. 24.

7 1/2' topo quad. Shannon (N. side). Lat. _____, Long. _____.

Field No. R-20, Collected by R. W. Smith Date 7-31-29

Sample Method Groove (12 ft.) + grab samples. Weathering/alteration Variably weathered.

Structural Attitude -

Stratigraphic Assignment Conasauga Group (Cambrian).

Sample Description & Comments Samples of hard, reddish-brown to gray shale, weathered into slabs which break into splintery fragments. 12 ft. groove sample taken from a cut on the Southern RR. (E. side), 1/2 to 1/4 mi. N. of Pinson Station (adjacent to the Watters property = Fl.31S-19) and grab samples from a "shallow prospect hole near the road" (railroad ?). This locality belonged to the National City Bank (Rome) when it was sampled and lies approximately 10.25 miles NE. of Rome (Smith, 1931, p. 118).

Compiled by B. J. O'Connor Date 2-10-86

CERAMIC TESTS AND ANALYSES

Material Clay — Compilation Map Location No. Fl.43-1

County Floyd. — Sample Number -

Raw Properties: — Lab & No. Hansard, #FL G 1.

Date Reported 8-12-43 — Ceramist W. C. Hansard, Ga. Tech.

Water of Plasticity - % Working Properties Not very plastic; somewhat sticky.

Color Light gray. Drying Shrinkage - % Dry Strength -

Remarks Drying properties: No warping of test tiles.

Slow Firing Tests: (in a gas-fired muffle kiln).

Approx. Temp. °F (°C)	Color	Hardness	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data: Remarks
1145 (2093) (Cone 01)	Light buff	Fairly hard*	8.2	c.15-20	-	Quite porous.
2138 (1170) (Cone 3)	Light buff	Fairly hard*	8.5	c.15-20	-	Quite porous.
2246 (1230) (Cone 6)	Light buff	Hard**	9.1	c.15-20	-	Quite porous. Free of warping at all cones.

* : can still be cut with a knife.
** : almost steel hard.

Remarks / Other Tests The clay would probably have to be mixed with a more plastic and lower-maturing clay for making pottery or structural clay products due to its stickiness and somewhat high maturing temperature. However, its color and lack of warpage indicate it might be worthwhile if blended properly.

Preliminary Bloating (Quick Firing) Tests: Not determined.

Crushing Characteristics (unfired material) -

Particle Size - Retention Time -

Chemical & Mineralogical Data: Not determined.

Chemical Analysis		Mineralogy	
Oxide	Weight %	Mineral	volume %
SiO_2			
TiO_2		Quartz	
Al_2O_3		Feldspar	
Fe_2O_3		Carbonate	
FeO		Mica	
MnO		Chlorite-vermiculite	
MgO		Montmorillonite	
CaO		Others	
Na_2O			
K_2O			
P_2O_5			
S (total)		Total	
C (org.)			
CO_2			
H_2O^-			
H_2O^+			
Ignition loss			
Total			

Analyst _____ _____

Date _____ _____

Method _____ _____

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. Shannon (or Wax?). Lat. _____, Long. _____.

Field No. -, Collected by M. N. Griffin. Date May 1943.

Sample Method Grab (?). Weathering/alteration -

Structural Attitude -

Stratigraphic Assignment Tertiary (?) - probably residual from Knox Group (Cambrian-Ordovician) carbonates.

Sample Description & Comments Light gray clay ("possibly of the fuller's earth or meta-bentonite types") which is somewhat sticky when wet, but does not seem to contain an appreciable quantity of grit. Collected by Mr. Griffin, Griffin Foundry & Machine Co., Rome, from his farm on the Kingston Road (Ga. Hwy. 293 - formerly Hwy. 20). (Unpubl. notes from Ga. Geol. Survey files.)

Compiled by B. J. O'Connor Date 8-12-86

CERAMIC TESTS AND ANALYSES

Material Clay (fine-grained kaolin). Compilation Map Location No. F1.46-1

County Floyd. Sample Number -

Raw Properties: Lab & No. USBM, Norris, TN; Ga-25.

Date Reported 7-18-46. Ceramist H. Wilson, USBM.

Water of Plasticity - % Working Properties Good plasticity and slakes readily.

Color Near white (yellow and red stains). Drying Shrinkage <25 % Dry Strength -

Slow Firing Tests:

Temp. °F (°C)	Color	Hardness	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data:
2192 (1200)	Almost white with red spots	Very hard	<25	-	-	-

Remarks / Other Tests This clay may be of possible use for structural clay products manufacture.

Preliminary Bloating (Quick Firing) Tests: Not determined. (No evidence of bloating from overfiring.)

Crushing Characteristics (unfired material) -

Particle Size ("fine-grained"). Retention Time 10 hours.

Chemical & Mineralogical Data: Not determined.

Chemical Analysis		Mineralogy	
Oxide	Weight %	Mineral	volume %
SiO_2			
TiO_2		Quartz	
Al_2O_3		Feldspar	
Fe_2O_3		Carbonate	
FeO		Mica	
MnO		Chlorite-vermiculite	
MgO		Montmorillonite	
CaO		Others	
Na_2O			
K_2O			
P_2O_5			
S (total)		Total	
C (org.)			
CO_2			
H_2O^-			
H_2O^+			
Ignition loss			
Total			

Analyst _____ _____

Date _____ _____

Method _____ _____

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. Shannon (NE. 1/4). Lat. _____, Long. _____.

Field No. -, Collected by K. H. Teague (TVA). Date June 1946.

Sample Method Grab (?). Weathering/alteration -

Structural Attitude -

Stratigraphic Assignment Tertiary (?) residual clay from Knox Group (Cambrian-Ordovician) carbonates.

Sample Description & Comments Sample of white clay collected from near an old bauxite mine (about) 3 miles east of Hermitage in eastern Floyd Co. (unpubl. notes from Ga. Geol. Survey files).

Compiled by B. J. O'Connor Date 11-29-82

CERAMIC TESTS AND ANALYSES

Material Shale (Floyd). Compilation Map Location No. Fl. 46-2

County Floyd. Sample Number 9.

Raw Properties: Lab & No. TVA, N. C. State College Research Lab Asheville, N. C.; TVA # 106

Date Reported 10-8-46 Ceramist M. K. Banks, TVA.

Water of Plasticity - % Working Properties -

Color Dark brown. Drying Shrinkage - % Dry Strength -

Slow Firing Tests: Not determined.

Temp. °F (°C)	Color	Hardness	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data:

Preliminary Bloating (Quick Firing) Tests: Negative.

Temp. °F °C	Absorption %	Bulk Density g/cm^3	Bulk Density lb/ft^3	Pore Structure
2350 (1288)	-	-	-	-
2400 (1316)	-	-	-	Gray-white color, not vitrified (too refractory).
2450 (1343)	-	-	-	-

Remarks Not usable, by itself, for light-weight aggregate manufacture.

Crushing Characteristics (unfired material) -

Particle Size -8 mesh. Retention Time 30 min. (in muffle furnace).

Chemical & Mineralogical Data: Not determined.

Chemical Analysis		Mineralogy	
Oxide	Weight %	Mineral	volume %
SiO_2			
TiO_2		Quartz	
Al_2O_3		Feldspar	
Fe_2O_3		Carbonate	
FeO		Mica	
MnO		Chlorite-vermiculite	
MgO		Montmorillonite	
CaO		Others	
Na_2O			
K_2O			
P_2O_5			
S (total)		Total	
C (org.)			
CO_2			
H_2O^-			
H_2O^+			
Ignition loss			
Total			

Analyst _____ _____

Date _____ _____

Method _____ _____

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. Rock Mountain (cntr.). Lat. _____, Long. _____.

Field No. 9, Collected by S. D. Broadhurst (TVA). Date 1946?

Sample Method Grab (?) Weathering/alteration -

Structural Attitude -

Stratigraphic Assignment Floyd Shale (Mississippian).

Sample Description & Comments Material is fresh, dark brown to black, banded shale which is quite high in silica and heavily iron stained. Sample taken from pit of the Oconee Clay Prods. Co. W. of Rome, 3/8 mile E. of Lavender Station on the Central of Ga. RR. (W. of map locn. #81, in Butts and Gildersleeve, 1948). (From an interim report on tests from N.E. Research Lab via H. S. Rankin, TVA, 10-22-46.)

Compiled by B. J. O'Connor Date 11-29-82

CERAMIC TESTS AND ANALYSES

Material Shale (Conasauga Group). Compilation Map Location No. Fl. 46-3

County Floyd. Sample Number 10.

Raw Properties: Lab & No. TVA, N. C. State College Research Lab Asheville, N. C.; TVA # 107

Date Reported 10-18-46 Ceramist M. K. Banks, TVA.

Water of Plasticity - % Working Properties -

Color Grayish-green. Drying Shrinkage - % Dry Strength -

Slow Firing Tests: Not determined.

Temp. °F (°C)	Color	Hardness	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data:

Preliminary Bloating (Quick Firing) Tests: Positive.

Temp. °F °C	Absorption %	Bulk Density g/cm^3	Bulk Density lb/ft^3	Pore structure
2350 (1288)	-	-	-	-
2400 (1316)	-	-	60	Excellent.
2450 (1343)	-	-	30	Excellent.

Remarks Bloating range = 2350 to about 2500°F (1288 to 1371°C); best at 2450°F (1343°C).

Crushing Characteristics (unfired material) -

Particle Size -8 mesh. Retention Time 30 min. (in muffle furnace).

Chemical & Mineralogical Data: Not determined.

Chemical Analysis		Mineralogy	
Oxide	Weight %	Mineral	volume %
SiO_2			
TiO_2		Quartz	
Al_2O_3		Feldspar	
Fe_2O_3		Carbonate	
FeO		Mica	
MnO		Chlorite-vermiculite	
MgO		Montmorillonite	
CaO		Others	
Na_2O			
K_2O			
P_2O_5			
S (total)		Total	
C (org.)			
CO_2			
H_2O^-			
H_2O^+			
Ignition loss			
Total			

Analyst _____ _____

Date _____ _____

Method _____ _____

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. Rome South (cntr.). Lat. _____, Long. _____.

Field No. 10, Collected by S. D.Broadhurst (TVA). Date 1946?

Sample Method Grab (?) Weathering/alteration -

Structural Attitude -

Stratigraphic Assignment Conasauga Group (Cambrian).

Sample Description & Comments Material is hard, grayish-green, quite sandy shale with abundant, thin sandstone layers. It is quite tough and blocky when fresh and weathers to light gray flakes. Location is 6 miles S. of Rome on U.S. 411-27 and 1/4 mi. N. of Six Mile Station. (From an interim report on tests from N.C. Research Lab via H. S. Rankin, TVA, 10-22-46; reported in Butts and Gildersleeve, 1948, p. 125, Table 8, no. 3.) Also see tests on 31S-16 and 60-1a to 60-1f.

Compiled by B. J. O'Connor Date 2-10-86

CERAMIC TESTS AND ANALYSES

Material Shale (Floyd). Compilation Map Location No. Fl.46-4

County Floyd. Sample Number 15.

Raw Properties: Lab & No. TVA, N. C. State College Research Lab Asheville, N. C.; TVA # 112.

Date Reported 10-8-46 Ceramist M. K. Banks, TVA.

Water of Plasticity - % Working Properties -

Color Black. Drying Shrinkage - % Dry Strength -

Slow Firing Tests: Not determined.

Temp. °F (°C)	Color	Hardness	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data:

Preliminary Bloating (Quick Firing) Tests: Negative.

Temp. °F °C	Absorption %	Bulk Density g/cm^3	Bulk Density lb/ft^3	Pore Structure
2350 (1288)	-	-	-	-
2400 (1316)	-	-	-	Gray-white color; not vitrified (too refractory).
2450 (1343)	-	-	-	-

Remarks Not usable, by itself, for light weight aggregate manufacture.

Crushing Characteristics (unfired material) -

Particle Size -8 mesh. Retention Time 30 min. (in muffle furnace).

Chemical & Mineralogical Data: Not determined.

Chemical Analysis		Mineralogy	
Oxide	Weight %	Mineral	volume %
SiO_2			
TiO_2		Quartz	
Al_2O_3		Feldspar	
Fe_2O_3		Carbonate	
FeO		Mica	
MnO		Chlorite-vermiculite	
MgO		Montmorillonite	
CaO		Others	
Na_2O			
K_2O			
P_2O_5			
S (total)		Total	
C (org.)			
CO_2			
H_2O^-			
H_2O^+			
Ignition loss			
Total			

Analyst _____ _____

Date _____ _____

Method _____ _____

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. Rome North (SW. 1/4). Lat. _____, Long. _____.

Field No. 15, Collected by S. D. Broadhurst (TVA) Date 1946?

Sample Method Grab (?) Weathering/alteration -

Structural Attitude -

Stratigraphic Assignment Floyd Shale (Mississippian).

Sample Description & Comments Sample is from west Rome just S. of the Central of Ga. RR., near Battey State Hospital. The shale is black, and ranges from hard and tough to soft and flaky. This deposit has been extensively worked for brick shale but large tonnages still remain. (From an interim report on tests from N. C. Research Lab via H. S. Rankin, TVA, 10-22-46). (Also see Fl. 31S-6.)

Compiled by B. J. O'Connor Date 11-29-82

CERAMIC TESTS AND ANALYSES

Material Clay (sandy kaolin). Compilation Map Location No. F1.48-1

County Floyd. Sample Number -

Raw Properties: Lab & No. USBM, Norris, TN; # Ga. 40.

Date Reported 7-21-48. Ceramist K. G. Skinner, USBM.

Water of Plasticity - % Working Properties -

Color White (?). Drying Shrinkage - % Dry Strength -

Slow Firing Tests:

Temp. °F (°C)	Color	Hardness	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data:
2372 (1300)	White	-	6.5	7.0	-	-

Remarks / Other Tests Washing the unfired clay removed 31.3% white silica sand which, if the iron content is low enough and the 10% fines of -200 mesh are not objectionable, might be used in glass, chemical or ceramic industry. Washing and/or screening the clay to remove the sand would probably reduce the fired absorption. The clay might then be used in making whiteware, refractories, or paper filler.

Preliminary Bloating (Quick Firing) Tests: Not determined.

Crushing Characteristics (unfired material) -

Particle Size - Retention Time -

Chemical & Mineralogical Data:

Chemical Analysis: Not determined.

Oxide	Weight %
SiO_2	
TiO_2	
Al_2O_3	
Fe_2O_3	
FeO	
MnO	
MgO	
CaO	
Na_2O	
K_2O	
P_2O_5	
S (total)	
C (org.)	
CO_2	
H_2O^-	
H_2O^+	
Ignition loss	
Total	

Mineralogy (partial):

Mineral	volume %
Quartz (sand)	31.3
Feldspar	
Carbonate	
Mica	
Chlorite-vermiculite	
Montmorillonite	
Others (largely kaolinite)	68.7
Total	100.00

Analyst K. G. Skinner, USBM.

Date 7-21-48

Method Washing to remove sand.

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. Unknown. Lat. _____, Long. _____.

Field No. -, Collected by W. M. Brown. Date c.July 1948.

Sample Method Grab (?). Weathering/alteration -

Structural Attitude -

Stratigraphic Assignment Tertiary (?)

Sample Description & Comments Sample of sandy kaolin submitted by Mr. W. M. Brown, Rt. 1, Rome, Ga. (Exact location and nature of sample not known-unpubl. data from Geol. Survey files).

Compiled by B. J. O'Connor Date 8-12-86

CERAMIC TESTS AND ANALYSES

Material Clay. Compilation Map Location No. F1.48-2

County Floyd. Sample Number Ga. 16

Raw Properties: Lab & No. TVA. #534 - 1 to 5.

Date Reported 10-25-48. Ceramist M. K. Banks., TVA.

Water of Plasticity - % Working Properties -

Color - Drying Shrinkage - % Dry Strength -

Slow Firing Tests:

Temp. °F (°C)	Color	Hardness	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data:

Preliminary Bloating (Quick Firing) Tests: Negative.

Temp. °F °C	Absorption %	Bulk Density g/cm^3	Bulk Density lb/ft^3	Remarks
2000 (1093)	-	-	-	No change - all samples (1 to 5).
2200 (1204)	-	-	-	Began to vitrify - samples 1 and 5. No change - samples 2 to 4.
2400 (1316)	-	-	-	Began to vitrify - all samples.

Remarks Samples do not appear to be suitable for lightweight aggregate manufacture.

Crushing Characteristics (unfired material) -

Particle Size - Retention Time -

Chemical & Mineralogical Data:

Chemical Analysis (Ignition loss only).

Oxide	Weight %
SiO_2	-
TiO_2	-
Al_2O_3	-
Fe_2O_3	-
FeO	-
MnO	-
MgO	-
CaO	-
Na_2O	-
K_2O	-
P_2O_5	-
S (total)	-
C (org.)	-
CO_2	-
H_2O^-	-
H_2O^+	-
Ignition loss	12.0 (#1) 10.0 (#2) 7.0 (#3 and #4) 8.0 (#5)
Total	-

Mineralogy: Not determined.

Mineral	volume %
Quartz	
Feldspar	
Carbonate	
Mica	
Chlorite-vermiculite	
Montmorillonite	
Others	
Total	

Analyst M. K. Banks, TVA.

Date 10-25-48.

Method -

Sample Location Data:

County Floyd. Land Lot ____, Sec. ____, Dist. ____.

7 1/2' topo quad. Livingston (?). Lat. ____, Long. ____.

Field No. -, Collected by W. P. Davis (?). Date 1948.

Sample Method Grab (?). Weathering/alteration -

Structural Attitude -

Stratigraphic Assignment Unknown.

Sample Description & Comments Clay sample from Mr. W. P. Davis of RFD#2, Cave Spring. (Exact location and nature of sample not known, but it may correspond to the Davis bauxite mine 3 miles NW. of Cave Spring - see White, and others, 1966, Plate 3).

Compiled by B. J. O'Connor Date 8-12-86

CERAMIC TESTS AND ANALYSES

Material Shale, soft (Floyd). Compilation Map Location No. Fl.57-1

County Floyd. Sample Number 1.

Raw Properties: Lab & No. USBM, Norris, TN.; No. 858-A.

Date Reported 10-21-57. Ceramist H. P. Hamlin, USBM.

Water of Plasticity 30 % Working Properties Fairly plastic and smooth-working. Extrusion Characteristics: Fair. pH = 8.50. Solu-Br. = 2.60.

Color Light red. Drying Shrinkage 5 % Dry Strength Good.

Remarks No drying defects.

Slow Firing Tests:

Temp. °F (°C)	Color	Hardness (Mohs')*	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data: App. Sp. Gr.
1800 (982)	Buff	Soft, crumbly (2)	5.5	17.2	-	2.66
2000 (1093)	Buff	Fair Hard (3)	7.5	13.4	-	2.64
2100 (1149)	Light buff-red	Very hard (5)	11.0	4.5	-	2.52
2200 (1204)	Red-brown	Steel hard (6)	13.5	1.3	-	2.47
2300 (1260)	Gray-brown	Steel hard (6)	13.5	0.7	-	2.33
2400 (1316)	Gray	Steel hard (6)	(Expanded)	7.5	-	2.18

Remarks / Other Tests Modulus of Rupture = 3500+ psi. This sample would probably be suitable for common brick or tile; mottled pattern rather attractive at 2100°F (1149°C). % shrinkage is on the high side. Petrographic analysis shows 5% + calcium carbonate. (Also see Fl.31S-11a and b).

Preliminary Bloating (Quick Firing) Tests: Negative.

*Note: Mohs hardness values are based on M.E. Tyrrell's 1967 revisions of 1964 test data sheets.

Crushing Characteristics (unfired material) -

Particle Size -20 mesh Retention Time 15 min. draw trials (following 3-4 hr. to 1800°F, 982°C).

Chemical & Mineralogical Data:

Chemical Analysis: Not determined.

Oxide	Weight %
SiO_2	
TiO_2	
Al_2O_3	
Fe_2O_3	
FeO	
MnO	
MgO	
CaO	
Na_2O	
K_2O	
P_2O_5	
S (total)	
C (org.)	
CO_2	
H_2O^-	
H_2O^+	
Ignition loss	
Total	

Mineralogy

Mineral	volume %
Quartz	X
Feldspar	-
Carbonate	5^+
Mica ("Hydrous")	X
Chlorite-vermiculite	-
Montmorillonite	-
Others	
"Kaolin"	X
"Iron"	3 to 7
Total	-

X = present in unspecified amounts.

Analyst H. P. Hamlin, USBM

Date 10-21-57.

Method X-ray and petrographic analysis.

Sample Location Data:

County Floyd. Land Lot , Sec. , Dist. .

7 1/2' topo quad. Rock Mountain (cntr.). Lat. , Long. .

Field No. 1, Collected by Ray & Furcron. Date August 1957.

Sample Method Grab (?). Weathering/alteration -

Structural Attitude -

Stratigraphic Assignment Floyd Shale (Mississippian).

Sample Description & Comments Sample of Floyd Shale from Chattahoochee Brick Company, about 3/4 mile E. of Lavender Station (Central of Ga. RR.), about 1/4 mile S. of Huffaker Road and N. of Oconee Clay Prods. Co. pit (Fl.57-12) as shown by Furcron (1958, p. 2 and 5, No. 28). This area was also sampled by Smith (1931, #11, p. 94) as part of the "T. A. Long property" (see Fl.31S-11a and b).

Compiled by B. J. O'Connor Date 8-12-86

CERAMIC TESTS AND ANALYSES

Material Shale, soft (Conasauga). Compilation Map Location No. F1.57-2

County Floyd. Sample Number 2.

Raw Properties: Lab & No. USBM; Norris, TN.; No. 858-B.

Date Reported 10-21-57. Ceramist H. P. Hamlin, USBM.

Water of Plasticity 30 % Working Properties Short working, not plastic.
Extrusion Characteristics: Fair. pH = 6.60. Solu-Br. = 4.90.

Color Red-brown. Drying Shrinkage 5 % Dry Strength Average.

Remarks No drying defects.

Slow Firing Tests:

Temp. °F (°C)	Color	Hardness (Mohs')*	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data: App. Sp. Gr.
1800 (982)	Medium buff	Soft, crumbly (2)	6.5	23.1	-	2.74
2000 (1093)	Medium buff	Soft, crumbly (2)	6.5	19.4	-	2.70
2100 (1149)	Light red	Fair hard (3)	10.0	14.2	-	2.66
2200 (1204)	Red-brown	Hard (4)	10.0	12.7	-	2.65
2300 (1260)	Brown	Hard (4)	11.0	8.5	-	2.56
2400 (1316)	Dark brown	Very hard (5)	11.0	3.3	-	2.58

Remarks / Other Tests Modulus of Rupture: 2500 psi. The commercial possibilities for brick and tile are fair; the soluble salt content is high (as shown by the scumming). Maturing temperature for brick is around 2300°F (1260°C) and the color at that temperature is poor.

Preliminary Bloating (Quick Firing) Tests: Negative.

*Note: Mohs hardness values are based on M.E. Tyrrell's 1967 revisions of 1964 test data sheets.

Crushing Characteristics (unfired material) -

Particle Size -20 mesh. Retention Time 15 min. draw trials (following 3-4 hr. to 1800°F, 982°C).

Chemical & Mineralogical Data:

Chemical Analysis: Not determined.

Oxide	Weight %
SiO_2	
TiO_2	
Al_2O_3	
Fe_2O_3	
FeO	
MnO	
MgO	
CaO	
Na_2O	
K_2O	
P_2O_5	
S (total)	
C (org.)	
CO_2	
H_2O^-	
H_2O^+	
Ignition loss	
Total	

Mineralogy

Mineral	volume %
Quartz	X
Feldspar	-
Carbonate	-
Mica ("Hydrous")	X
Chlorite-vermiculite	-
Montmorillonite	-
Others	
"Kaolin"	X
"Iron"	3 to 7
Total	-

X = present in unspecified amounts.

Analyst H. P. Hamlin, USBM.

Date 10-21-57.

Method X-ray and petrographic analysis.

Sample Location Data:

County Floyd. Land Lot ____, Sec. ____, Dist. ____.

7 1/2' topo quad. Livingston (NW. 1/4). Lat. ____, Long. ____.

Field No. 2, Collected by Ray and Furcron. Date August 1957.

Sample Method Grab (?). Weathering/alteration -

Structural Attitude -

Stratigraphic Assignment Conasauga Group (Cambrian).

Sample Description & Comments Sample of Conasauga shale from a large roadcut on Ga. Hwy. 100 (Foster's Mill Rd.). The cut is about 800 ft. long and ranges from 10 to 25 ft. high (N. to S.) on the Jack Rogers property about 1 mile S. of the Coosa River (Furcron, 1958, p. 6, No. 33 and D. Ray, unpubl. notes, Aug. 1957, Ga. Geol. Survey files).

Compiled by B. J. O'Connor Date 3-14-86

CERAMIC TESTS AND ANALYSES

Material Shale, soft (Conasauga). Compilation Map Location No. F1.57-3

County Floyd. Sample Number 3.

Raw Properties: Lab & No. USBM; Norris, TN.; No. 858-C.

Date Reported 10-21-57. Ceramist H. P. Hamlin, USBM.

Water of Plasticity 19 % Working Properties Short - working, not too plastic. Extrusion Characteristics: Poor. pH = 5.7. Solu-Br. = 0.54.

Color Light red. Drying Shrinkage 5 % Dry Strength Good.

Remarks No drying defects.

Slow Firing Tests:

Temp. °F (°C)	Color	Hardness (Mohs')*	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data: App. Sp. Gr.
1800 (982)	Medium buff	Soft, crumbly (2)	5.0	14.6	-	2.72
2000 (1093)	Orange-red	Fair hard (3)	5.5	11.6	-	2.67
2100 (1149)	Red	Hard (4)	8.5	6.6	-	2.63
2200 (1204)	Red-brown	Hard (4)	9.0	5.5	-	2.59
2300 (1260)	Dark brown	Very hard (5)	7.5	3.6	-	2.42
2400 (1316)	Dark brown	(slight bloating)	(5.5)	8.4	-	2.25

Remarks / Other Tests Modulus of Rupture = 2800 psi. Commercial possibilities for brick and tile are rather poor; might make a very common brick at 2100 - 2150°F (1149-1177°C).

Preliminary Bloating (Quick Firing) Tests: Negative.

*Note: Mohs hardness values are based on M.E.Tyrrell's 1967 revisions of 1964 test data sheets.

Crushing Characteristics (unfired material) -

Particle Size -20 mesh. Retention Time 15 min. draw trials (following 3-4 hr. to 1800°F, 982°C).

Chemical & Mineralogical Data:

Chemical Analysis: Not determined.

Oxide	Weight %
SiO_2	
TiO_2	
Al_2O_3	
Fe_2O_3	
FeO	
MnO	
MgO	
CaO	
Na_2O	
K_2O	
P_2O_5	
S (total)	
C (org.)	
CO_2	
H_2O^-	
H_2O^+	
Ignition loss	
Total	

Mineralogy Mineral	volume %
Quartz	X
Feldspar	-
Carbonate	-
Mica ("Hydrous")	X
Chlorite-vermiculite	-
Montmorillonite	-
Others	
"Kaolin"	X
"Iron"	3 to 7
Total	-

X = present in unspecified amounts.

Analyst H. P. Hamlin, USBM.

Date 10-21-57.

Method X-ray and petrographic analysis.

Sample Location Data:

County Floyd. Land Lot , Sec. , Dist. .

7 1/2' topo quad. Livingston (E. center) Lat. , Long. .

Field No. 3 , Collected by Ray and Furcron Date August 1957.

Sample Method Grab (?). Weathering/alteration -

Structural Attitude -

Stratigraphic Assignment Conasauga Group (Cambrian).

Sample Description & Comments Sample of Conasauga shale from roadcut on Ga. Hwy. 100 (Foster's Mill Rd.) between Coosa and Cave Spring, about 1.2 miles S. of Livingston (D. Ray, unpubl. notes, Aug. 1957, Ga. Geol. Survey files).

Compiled by B. J. O'Connor Date 3-10-86

CERAMIC TESTS AND ANALYSES

Material Shale, soft (Conasauga). Compilation Map Location No. F1.57-4

County Floyd. Sample Number 4.

Raw Properties: Lab & No. USBM; Norris, TN.; No. 858-D.

Date Reported 10-21-57. Ceramist H. P. Hamlin, USBM.

Water of Plasticity 10 % Working Properties Short-working, not plastic.
Extrusion Characteristics: Not determined. pH = 7.20. Solu-Br. = 1.61.

Color Light red. Drying Shrinkage 5 % Dry Strength Very low.

Remarks -

Slow Firing Tests:

Temp. °F (°C)	Color	Hardness (Mohs')*	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data: App. Sp. Gr.
1800 (982)	(Disintegrated in water)		-	-	-	-
2000 (1093)	(Disintegrated in water)		-	-	-	-
2100 (1149)	Brown	Hard (4)	2.5 (Expanded)	15.4	-	2.59
2200 (1204)	Brown	Steel hard (6)	2.5 (Expanded)	11.7	-	2.45
2300 (1260)	Melted	-	-	-	-	-

Remarks / Other Tests No commercial possibilities for brick or tile.
Petrographic analysis shows 10% calcium carbonate.

Preliminary Bloating (Quick Firing) Tests: Negative.

*Note: Mohs hardness values are based on M.E. Tyrrell's 1967 revisions of 1964 test data sheets.

Crushing Characteristics (unfired material) -

Particle Size -20 mesh. Retention Time 15 min. draw trials (following 3-4 hr. to 1800°F, 982°C).

Chemical & Mineralogical Data:

Chemical Analysis: Not determined.

Oxide	Weight %
SiO_2	
TiO_2	
Al_2O_3	
Fe_2O_3	
FeO	
MnO	
MgO	
CaO	
Na_2O	
K_2O	
P_2O_5	
S (total)	
C (org.)	
CO_2	
H_2O^-	
H_2O^+	
Ignition loss	
Total	

Mineralogy

Mineral	volume %
Quartz	X
Feldspar	-
Carbonate	10
Mica ("Hydrous")	X
Chlorite-vermiculite	-
Montmorillonite	-
Others	
"Kaolin"	X
"Iron"	3 to 7
Total	-

X = present in unspecified amounts.

Analyst _____ H. P. Hamlin, USBM.

Date _____ 10-21-57.

Method _____ X-ray and petrographic analysis.

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. Livingston (SW. 1/4). Lat. _____, Long. _____.

Field No. 4, Collected by Ray and Furcron. Date August 1957.

Sample Method Grab (?). Weathering/alteration -

Structural Attitude -

Stratigraphic Assignment Conasauga Group (Cambrian).

Sample Description & Comments Sample of Conasauga shale from roadcut on Ga. Hwy. 100 (Foster's Mill Rd.) about 1/2 mile N. of Cedar Creek Church and 1/4 mile N. of McGee Bend Rd. (D. Ray, unpubl. notes, Aug. 1957, Ga. Geol. Survey files).

Compiled by B. J. O'Connor Date 3-10-86

CERAMIC TESTS AND ANALYSES

Material Shale, sandy, very hard (Rome Fm.?) Compilation Map Location No. Fl.57-5

County Floyd. Sample Number 5.

Raw Properties: Lab & No. USBM; Norris, TN.; No. 858-E.

Date Reported 10-21-57. Ceramist H. P. Hamlin, USBM.

Water of Plasticity 19 % Working Properties Short-working, not plastic.
Extrusion Characteristics: Not determined. pH = 8.21. Solu-Br.= 2.40.

Color Dark gray. Drying Shrinkage 1.5 % Dry Strength Very low.

Slow Firing Tests:

Temp. °F (°C)	Color	Hardness	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data: App. Sp. Gr.
1800 (982)	(Disintegrated in water)		-	-	-	-
2000 (1093)	(Disintegrated in water)		-	-	-	-
2100 (1149)	(Disintegrated in water)		-	-	-	-
2200 (1204)	(Disintegrated in water)		-	-	-	-
2300 (1260)	Glazed, melted and expanded		-	-	-	-

Remarks / Other Tests No commercial possibilities for brick or tile. Petrographic analysis shows high calcium carbonate content.

Preliminary Bloating (Quick Firing) Tests: Negative.

Crushing Characteristics (unfired material) -

Particle Size -20 mesh. Retention Time 15 min. draw trials (following 3-4 hr. to 1800°F, 982°C).

Chemical & Mineralogical Data:

Chemical Analysis: Not determined.

Oxide	Weight %
SiO_2	
TiO_2	
Al_2O_3	
Fe_2O_3	
FeO	
MnO	
MgO	
CaO	
Na_2O	
K_2O	
P_2O_5	
S (total)	
C (org.)	
CO_2	
H_2O^-	
H_2O^+	
Ignition loss	
Total	

Mineralogy

Mineral	volume %
Quartz	X
Feldspar	-
Carbonate	"High"
Mica ("Hydrous")	X
Chlorite-vermiculite	-
Montmorillonite	-
Others	
"Kaolin"	X
"Iron"	3 to 7
Total	-

X = present in unspecified amounts.

Analyst _____ H. P. Hamlin, USBM.

Date _____ 10-21-57.

Method _____ X-ray and petrographic analysis.

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. Livingston (SE. base). Lat. _____, Long. _____.

Field No. 5, Collected by Ray and Furcron Date August 1957.

Sample Method Grab (?). Weathering/alteration -

Structural Attitude -

Stratigraphic Assignment Rome Formation (?) (Cambrian).

Sample Description & Comments Shale sample from roadcut on Ga. Hwy. 100, about 1-1/2 miles N. of U. S. Hwy. 411 and composed of dark red, apparently iron-rich, shale (D. Ray, unpubl. notes, Aug. 1957, Ga. Geol. Survey files).

Compiled by B. J. O'Connor Date 8-12-86

CERAMIC TESTS AND ANALYSES

Material Shale, soft. Compilation Map Location No. F1.57-6

County Floyd. Sample Number 6.

Raw Properties: Lab & No. USBM; Norris, TN.; No. 858-F

Date Reported 10-21-57. Ceramist H. P. Hamlin, USBM.

Water of Plasticity 22 % Working Properties Short-working, not plastic.
Extrusion Characteristics: Not determined. pH = 5.70. Solu-Br. = 0.82.

Color Red-brown. Drying Shrinkage 2.5 % Dry Strength Very low.

Slow Firing Tests:

Temp. °F (°C)	Color	Hardness (Mohs')*	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data: App. Sp. Gr.
1800 (982)	Buff	Soft, crumbly (2)	4.0	21.1	-	2.67
2000 (1093)	Buff	Soft, crumbly (2)	4.5	26.1	-	2.69
2100 (1149)	Buff	Soft, crumbly (2)	4.5	17.8	-	2.67
2200 (1204)	Red	Fair hard (3)	7.5	15.5	-	2.64
2300 (1260)	Red-brown	Hard (4)	9.0	11.2	-	2.59
2400 (1316)	Gray-brown	Very hard (5)	10.0	7.3	-	2.54

Remarks / Other Tests No commercial possibilities for brick or tile.

Preliminary Bloating (Quick Firing) Tests: Negative.

*Note: Mohs hardness values are based on M.E. Tyrrell's 1967 revisions of 1964 test data sheets.

Crushing Characteristics (unfired material) -

Particle Size -20 mesh. Retention Time 15 min. draw trials (following 3-4 hr. to 1800°F, 982°C).

Chemical & Mineralogical Data:

Chemical Analysis : Not determined.

Oxide	Weight %
SiO_2	
TiO_2	
Al_2O_3	
Fe_2O_3	
FeO	
MnO	
MgO	
CaO	
Na_2O	
K_2O	
P_2O_5	
S (total)	
C (org.)	
CO_2	
H_2O^-	
H_2O^+	
Ignition loss	
Total	

Mineralogy

Mineral	volume %
Quartz	X
Feldspar	-
Carbonate	-
Mica ("Hydrous")	X
Chlorite-vermiculite	-
Montmorillonite	-
Others	
"Kaolin"	X
"Iron"	3 to 7
Total	-

X = present in unspecified amounts.

Analyst H. P. Hamlin, USBM.

Date 10-21-57.

Method X-ray and petrographic analysis.

Sample Location Data:

County Floyd. Land Lot , Sec. , Dist. .

7 1/2' topo quad. Rome North (NW. 1/4) . Lat. , Long. .

Field No. 6 , Collected by Ray and Furcron. Date August 1957.

Sample Method Grab (?). Weathering/alteration -

Structural Attitude -

Stratigraphic Assignment (Mississippian Floyd Shale, or Hartselle Sandstone Member or Bangor Limestone?)

Sample Description & Comments Sample from along Texas Valley Rd., about 4.5 miles W. of U. S. Hwy. 27 in NW. part of Floyd County (D. Ray, unpubl. notes, Aug. 1957, Ga. Geol. Survey files).

Compiled by B. J. O'Connor Date 8-12-86

CERAMIC TESTS AND ANALYSES

Material Shale, soft. Compilation Map Location No. F1.57-7

County Floyd. Sample Number 7.

Raw Properties: Lab & No. USBM, Norris, TN.; No. 858-G.

Date Reported 10-21-57. Ceramist H. P. Hamlin, USBM.

Water of Plasticity 19 % Working Properties Short-working, sandy, not plastic. Extrusion Char.: Not determined. pH = 5.70. Solu-Br. = 0.40.

Color Red-brown. Drying Shrinkage 1.0 % Dry Strength Very low.

Remarks No drying defects.

Slow Firing Tests:

Temp. °F (°C)	Color	Hardness (Mohs')*	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data: App. Sp. Gr
1800 (982)	Light buff	Soft, crumbly (2)	1.0	18.7	-	2.65
2000 (1093)	Light buff	Soft, crumbly (2)	2.0	19.2	-	2.63
2100 (1149)	Orange-buff	Soft, crumbly (2)	2.0	18.7	-	2.54
2200 (1204)	Brown-red	Hard (4)	6.0	17.1	-	2.59
2300 (1260)	Dark brown	Very hard (5)	6.0	13.2	-	2.55
2400 (1316)	Dark brown	Very hard (5)	6.0	10.1	-	2.52

Remarks / Other Tests Commercial possibilities for brick and tile are fair.

Preliminary Bloating (Quick Firing) Tests: Negative.

*Note: Mohs hardness values are based on M.E. Tyrrell's 1967 revisions of 1964 test data sheets.

Crushing Characteristics (unfired material) -

Particle Size -20 mesh. Retention Time 15 min. draw trials (following 3-4 hr. to 1800°F, 982°C).

Chemical & Mineralogical Data:

Chemical Analysis: Not determined.

Oxide	Weight %
SiO_2	
TiO_2	
Al_2O_3	
Fe_2O_3	
FeO	
MnO	
MgO	
CaO	
Na_2O	
K_2O	
P_2O_5	
S (total)	
C (org.)	
CO_2	
H_2O^-	
H_2O^+	
Ignition loss	
Total	

Mineralogy

Mineral	volume %
Quartz	X
Feldspar	-
Carbonate	-
Mica ("Hydrous")	X
Chlorite-vermiculite	-
Montmorillonite	-
Others	
"Kaolin"	X
"Iron"	3 to 7
Total	-

X = present in unspecified amounts.

Analyst H. P. Hamlin, USBM.

Date 10-21-57.

Method x-ray and petrographic analysis.

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. Rock Mountain (NE. 1/4). Lat. _____, Long. _____.

Field No. 7, Collected by Ray and Furcron. Date August 1957.

Sample Method Grab (?). Weathering/alteration -

Structural Attitude -

Stratigraphic Assignment (Mississippian Floyd Shale, or Hartsell Sandstone Member or Bangor Limestone?)

Sample Description & Comments Sample from the Mrs. C. W. Boggs property along Sand Springs Rd., about 2.1 miles W. of Fl.57-6 and about 1.8 miles E. of Sand Springs Church (Furcron, 1958, p. 6-7, No. 36).

Compiled by B. J. O'Connor Date 8-12-86

CERAMIC TESTS AND ANALYSES

Material Shale, soft (Floyd). Compilation Map Location No. F1.57-8

County Floyd. Sample Number 8.

Raw Properties: Lab & No. USBM, Norris, TN.; No. 858-H.

Date Reported 10-21-57. Ceramist H. P. Hamlin, USBM.

Water of Plasticity 22 % Working Properties Short-working, not plastic. Extrusion Characteristics: Poor. pH = 6.05. Solu-Br. = 0.52.

Color Dark brown. Drying Shrinkage 2.5 % Dry Strength Very low.

Remarks No drying defects.

Slow Firing Tests:

Temp. °F (°C)	Color	Hardness (Mohs')*	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data: App. Sp. Gr.
1800 (982)	Light buff	Soft, crumbly (2)	3.0	19.5	-	2.67
2000 (1093)	Light buff	Fair hard (3)	4.5	14.7	-	2.37
2100 (1149)	Buff	Hard (4)	4.5	13.1	-	2.57
2200 (1204)	Red-brown	Very hard (5)	8.0	7.8	-	2.41
2300 (1260)	Gray-brown	Very hard (5)	1.0	13.0	-	1.78
2400 (1316)	Gray-brown	Very hard (5)	(Expanded)	11.0	-	1.72

Remarks / Other Tests Modulus of Rupture: 2100 psi. Commercial possibilities for brick and tile are fair. Maturing temperature is high and firing range short; working properties are very poor. Petrographic analysis shows 4% + calcium carbonate.

Preliminary Bloating (Quick Firing) Tests: Negative.

*Note: Mohs hardness values are based on M.E. Tyrrell's 1967 revisions of 1964 test data sheets.

Crushing Characteristics (unfired material) -

Particle Size -20 mesh. Retention Time 15 min. draw trials (following 3-4 hr. to 1800°F, 982°C).

Chemical & Mineralogical Data:

Chemical Analysis: Not determined.

Oxide	Weight %
SiO_2	
TiO_2	
Al_2O_3	
Fe_2O_3	
FeO	
MnO	
MgO	
CaO	
Na_2O	
K_2O	
P_2O_5	
S (total)	
C (org.)	
CO_2	
H_2O^-	
H_2O^+	
Ignition loss	
Total	

Mineralogy

Mineral	volume %
Quartz	X
Feldspar	-
Carbonate	4+
Mica ("Hydrous")	X
Chlorite-vermiculite	-
Montmorillonite	-
Others	
"Kaolin"	X
"Iron"	3 to 7
Total	-

X = present in unspecified amounts.

Analyst _____ H. P. Hamlin, USBM.

Date _____ 10-21-57.

Method _____ X-ray and petrographic analysis

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. Rock Mountain (NE. 1/4). Lat. _____, Long. _____.

Field No. 8, Collected by Ray and Furcron Date August 1957.

Sample Method Grab (?). Weathering/alteration -

Structural Attitude -

Stratigraphic Assignment Floyd Shale (Mississippian).

Sample Description & Comments Sample from along Sand Springs Rd., about 0.7 mile W. of Fl.57-7 and about 1.1 miles E. of Sand Springs Church. The shale is very dark, almost black, unlike typical Floyd Shale in the area and resembles the Chattanooga Shale (Furcron, 1958, p. 6, No. 35 and D. Ray, unpubl. notes, Aug. 1957 Ga. Geol. Survey files).

Compiled by B. J. O'Connor Date 8-12-86

CERAMIC TESTS AND ANALYSES

Material Shale, soft (Floyd). Compilation Map Location No. Fl.57-9

County Floyd. Sample Number 9.

Raw Properties: Lab & No. USBM; Norris, TN.; 858-I.

Date Reported 10-21-57. Ceramist H. P. Hamlin, USBM.

Water of Plasticity 22 % Working Properties Short-working, not plastic.
Extrusion Characteristics: Not determined. pH = 6.05. Solu-Br. = 0.42.

Color Brown. Drying Shrinkage 3.5 % Dry Strength Very low.

Remarks No drying defects.

Slow Firing Tests:

Temp. °F (°C)	Color	Hardness (Mohs')*	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data: App. Sp. Gr.
1800 (982)	Light buff	Soft, crumbly (2)	5.0	18.6	-	2.62
2000 (1093)	Light buff	Soft, crumbly (2)	5.0	17.4	-	2.60
2100 (1149)	Light buff	Fair hard (3)	5.0	13.3	-	2.60
2200 (1204)	Brown-gray	Hard (4)	5.5	2.1	-	2.23
2300 (1260)	Gray	Very hard (5)	(Expanded)	10.8	-	2.04
2400 (1316)	Gray	Very hard (5)	(Expanded)	8.3	-	1.88

Remarks / Other Tests No commercial possibilities. (Sample very similar to "J" = Fl.57-10.)

Preliminary Bloating (Quick Firing) Tests: Negative.

*Note: Mohs hardness values are based on M.E. Tyrrell's 1967 revisions of 1964 test data sheets.

Crushing Characteristics (unfired material) -

Particle Size -20 mesh. Retention Time 15 min. draw trials (following 3-4 hr. to 1800°F, 982°C).

Chemical & Mineralogical Data:

Chemical Analysis: Not determined.

Oxide	Weight %
SiO_2	
TiO_2	
Al_2O_3	
Fe_2O_3	
FeO	
MnO	
MgO	
CaO	
Na_2O	
K_2O	
P_2O_5	
S (total)	
C (org.)	
CO_2	
H_2O^-	
H_2O^+	
Ignition loss	
Total	

Mineralogy

Mineral	volume %
Quartz	X
Feldspar	-
Carbonate	-
Mica ("Hydrous")	X
Chlorite-vermiculite	-
Montmorillonite	-
Others	
"Kaolin"	X
"Iron"	3 to 7
Total	-

X = present in unspecified amounts.

Analyst H. P. Hamlin, USBM.

Date 10-21-57.

Method X-ray and petrographic analysis.

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. Rock Mountain (NW. 1/4). Lat. _____, Long. _____.

Field No. 9, Collected by Ray and Furcron Date August 1957.

Sample Method Grab (?). Weathering/alteration -

Structural Attitude -

Stratigraphic Assignment Floyd Shale (Mississippian).

Sample Description & Comments Sample of Floyd Shale from along Big Texas Valley Rd., about 2.5 miles W. of Antioch Church and about 1/2 mile E. of Fouche Gap Rd. (D. Ray, unpubl. notes, Aug. 1957, Ga. Geol. Survey files).

Compiled by B. J. O'Connor Date 8-12-86

CERAMIC TESTS AND ANALYSES

Material Shale, soft (Floyd). Compilation Map Location No. F1.57-10

County Floyd. Sample Number 10.

Raw Properties: Lab & No. USBM; Norris, TN.; No. 858-J.

Date Reported 10-21-57. Ceramist H. P. Hamlin, USBM.

Water of Plasticity 24 % Working Properties Short and sandy-working.
Extrusion Characteristics: Not determined. pH = 5.7. Solu-Br. = 0.50.

Color Brown. Drying Shrinkage 3.5 % Dry Strength Very low.

Remarks No drying defects.

Slow Firing Tests:

Temp. °F (°C)	Color	Hardness (Mohs')*	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data: App. Sp. Gr.
1800 (982)	Light buff	Soft, crumbly (2)	4.5	20.3	-	2.64
2000 (1093)	Light buff	Soft, crumbly (2)	5.5	19.5	-	2.65
2100 (1149)	Light buff	Fair hard (3)	5.5	16.0	-	2.53
2200 (1204)	Brown-gray	Hard (4)	9.0	8.9	-	2.35
2300 (1260)	Gray	Very hard (5)	(Expanded)	9.5	-	2.16
2400 (1316)	Gray	Very hard (5)	(Expanded)	11.7	-	2.03

Remarks / Other Tests No commercial possibilities for brick or tile. (Sample very similar to "I" = F1.57-9).

Preliminary Bloating (Quick Firing) Tests: Negative.

*Note: Mohs hardness values are based on M.E. Tyrrell's 1967 revisions of 1964 test data sheets.

Crushing Characteristics (unfired material) -

Particle Size -20 mesh. Retention Time 15 min. draw trials (following 3-4 hr. to 1800°F, 982°C).

Chemical & Mineralogical Data:

Chemical Analysis: Not determined.

Oxide	Weight %
SiO_2	
TiO_2	
Al_2O_3	
Fe_2O_3	
FeO	
MnO	
MgO	
CaO	
Na_2O	
K_2O	
P_2O_5	
S (total)	
C (org.)	
CO_2	
H_2O^-	
H_2O^+	
Ignition loss	
Total	

Mineralogy

Mineral	volume %
Quartz	X
Feldspar	-
Carbonate	-
Mica ("Hydrous")	X
Chlorite-vermiculite	-
Montmorillonite	-
Others	
"Kaolin"	X
"Iron"	3 to 7
Total	-

X = present in unspecified amounts.

Analyst H. P. Hamlin, USBM.

Date 10-21-57.

Method X-ray and petrographic analysis.

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. Rock Mountain (N. side). Lat. _____, Long. _____.

Field No. 10, Collected by Ray and Furcron Date August 1957.

Sample Method Grab (?). Weathering/alteration -

Structural Attitude -

Stratigraphic Assignment Floyd Shale (Mississippian).

Sample Description & Comments Sample of Floyd Shale from along Big Texas Valley Rd., about 1.1 miles W. of Antioch Church and about 1.4 miles E. of Fl.57-9 (D. Ray, unpubl. notes, Aug. 1957, Ga. Geol. Survey files).

Compiled by B. J. O'Connor Date 3-10-86

CERAMIC TESTS AND ANALYSES

Material Shale, soft (Floyd). Compilation Map Location No. Fl.57-11

County Floyd. Sample Number 11.

Raw Properties: Lab & No. USBM; Norris, TN.; No. 858-K.

Date Reported 10-21-57. Ceramist H. P. Hamlin, USBM.

Water of Plasticity 27 % Working Properties Fairly plastic and smooth-working. Extrusion Characteristics: Not determined. pH = 5.3. Solu-Br. = 0.74.

Color Light red. Drying Shrinkage 4.0 % Dry Strength Low.

Remarks No drying defects.

Slow Firing Tests:

Temp. °F (°C)	Color	Hardness (Mohs')*	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data: App. Sp. Gr.
1800 (982)	Buff	Soft, crumbly (2)	5.0	19.0		2.66
2000 (1093)	Buff	Soft, crumbly (2)	5.0	18.8	-	2.68
2100 (1149)	Orange-buff	Hard (4)	9.5	21.9	-	2.69
2200 (1204)	Dark brown	Very hard (5)	12.5	6.1	-	2.51
2300 (1260)	Dark brown	Very hard (5)	12.5	4.6	-	2.36
2400 (1316)	Dark brown	Steel hard (6)	(Expanded)	5.7	-	2.23

Remarks / Other Tests Commercial possibilities for brick and tile are poor.

Preliminary Bloating (Quick Firing) Tests: Negative.

*Note: Mohs hardness values are based on M.E. Tyrrell's 1967 revisions of 1964 test data sheets.

Crushing Characteristics (unfired material) -

Particle Size -20 mesh. Retention Time 15 min. draw trials (following 3-4 hr. to 1800°F, 982°C).

Chemical & Mineralogical Data:

Chemical Analysis: Not determined.

Oxide	Weight %
SiO_2	
TiO_2	
Al_2O_3	
Fe_2O_3	
FeO	
MnO	
MgO	
CaO	
Na_2O	
K_2O	
P_2O_5	
S (total)	
C (org.)	
CO_2	
H_2O^-	
$H2O^+$	
Ignition loss	
Total	

Mineralogy

Mineral	volume %
Quartz	X
Feldspar	-
Carbonate	-
Mica ("Hydrous")	X
Chlorite-vermiculite	-
Montmorillonite	-
Others	
"Kaolin"	X
"Iron"	3 to 7
Total	-

X = present in unspecified amounts.

Analyst H. P. Hamlin, USBM.

Date 10-21-57.

Method X-ray and petrographic analysis.

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. Rock Mountain (cntr.). Lat. _____, Long. _____.

Field No. 11, Collected by Ray and Furcron. Date August 1957.

Sample Method Grab (?). Weathering/alteration -

Structural Attitude -

Stratigraphic Assignment Floyd Shale (Mississippian).

Sample Description & Comments Sample of Floyd Shale from pit (about 800 x 100 ft. and 10-12 ft. deep) operated by Oconee Clay Products Company, about 1/2 mile S. of intersection of Huffaker Rd. and Fouche Gap Rd. (Furcron, 1958, p. 5, No,. 27). Shale is blended with others from the 2 nearby pits (Fl.57-12 and 13) which are said to have better ceramic qualities (D. Ray, unpubl. notes, Aug. 1957, Ga. Geol. Survey files).

Compiled by B. J. O'Connor Date 8-12-86

CERAMIC TESTS AND ANALYSES

Material Shale, soft (Floyd). Compilation Map Location No. Fl.57-12

County Floyd. Sample Number 12.

Raw Properties: Lab & No. USBM; Norris, TN.; No. 858-L.

Date Reported 10-21-57. Ceramist H. P. Hamlin, USBM.

Water of Plasticity 28 % Working Properties Fairly plastic and smooth-working. Extrusion Char.: Not determined. pH = 5.9. Solu-Br. = 0.35.

Color Light red. Drying Shrinkage 5 % Dry Strength Low.

Remarks No drying defects.

Slow Firing Tests:

Temp. °F (°C)	Color	Hardness (Mohs')*	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data: App. Sp. Gr.
1800 (982)	Light buff	Soft, crumbly (2)	5.5	12.8	-	2.60
2000 (1093)	Light buff	Soft, crumbly (2)	6.5	17.7	-	2.60
2100 (1149)	Orange-buff	Hard (4)	10.5	21.0	-	2.54
2200 (1204)	Gray-brown	Steel hard (6)	15.0	2.6	-	2.44
2300 (1260)	Gray-brown	Steel hard (6)	15.0	1.8	-	2.40
2400 (1316)	Gray-brown	Steel hard (6)	15.0	1.2	-	2.34

Remarks / Other Tests Commercial possibilities for brick and tile are poor.

Preliminary Bloating (Quick Firing) Tests: Negative.

*Note: Mohs hardness values are based on M.E. Tyrrell's 1967 revisions of 1964 test data sheets.

Crushing Characteristics (unfired material) -

Particle Size -20 mesh. Retention Time 15 min. draw trials (following 3-4 hr. to 1800°F, 982°C).

Chemical & Mineralogical Data:

Chemical Analysis: Not determined.

Oxide	Weight %
SiO_2	
TiO_2	
Al_2O_3	
Fe_2O_3	
FeO	
MnO	
MgO	
CaO	
Na_2O	
K_2O	
P_2O_5	
S (total)	
C (org.)	
CO_2	
H_2O^-	
H_2O^+	
Ignition loss	
Total	

Mineralogy

Mineral	volume %
Quartz	X
Feldspar	-
Carbonate	-
Mica ("Hydrous")	X
Chlorite-vermiculite	-
Montmorillonite	-
Others	
"Kaolin"	X
"Iron"	3 to 7
Total	-

X = present in unspecified amounts.

Analyst _____ H. P. Hamlin, USBM.

Date _____ 10-21-57.

Method _____ X-ray and petrographic analysis.

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. Rock Mountain (cntr.). Lat. _____, Long. _____.

Field No. 12, Collected by Ray and Furcron. Date August 1957.

Sample Method Grab (?). Weathering/alteration -

Structural Attitude -

Stratigraphic Assignment Floyd Shale (Mississippian).

Sample Description & Comments Sample of Floyd Shale from a pit operated by Oconee Clay Products Co. (about 1500 x 200-300 ft. and 10-20 ft. deep) on the N. side of the Central of Ga. RR., about 0.3 mile S. of Huffaker Rd. and about 3/4 mile SW. of Fouche Gap Rd. intersection (just S. of Chattahoochee Brick Co. pit = Fl.57-1), about 9 miles NW. of Rome (Furcron, 1958, p. 5, No. 29 and D. Ray, unpubl. notes, Aug. 1957, Ga. Geol. Survey files). (Also see Fl. 31S-10).

Compiled by B. J. O'Connor Date 3-10-86

CERAMIC TESTS AND ANALYSES

Material Shale, soft (Floyd). Compilation Map Location No. Fl.57-13

County Floyd. Sample Number 13.

Raw Properties: Lab & No. USBM; Norris, TN.; No. 858-M.

Date Reported 10-21-57. Ceramist H. P. Hamlin, USBM.

Water of Plasticity 24 % Working Properties Fairly plastic and smooth-working. Extrusion Characteristics: Good. pH = 5.7. Solu-Br. = 0.35.

Color Light red. Drying Shrinkage 5 % Dry Strength Average.

Remarks No drying defects.

Slow Firing Tests:

Temp. °F (°C)	Color	Hardness (Mohs')*	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data: App. Sp. Gr.
1800 (982)	Buff	Soft, crumbly (2)	4.5	18.4	-	2.58
2000 (1093)	Buff	Soft, crumbly (2)	6.5	13.4	-	2.57
2100 (1149)	Orange-buff	Hard (4)	9.5	8.4	-	2.53
2200 (1204)	Red	Steel hard (6)	13.0	3.6	-	2.47
2300 (1260)	Gray-brown	Steel hard (6)	13.0	1.3	-	2.34
2400 (1316)	Gray	Steel hard (6)	(Expanded)	2.4	-	2.05

Remarks / Other Tests Modulus of Rupture: 3800 psi. Commercial possibilities for brick and tile are fair. Color is good at 2200°F (1204°C); firing range is rather short.

Preliminary Bloating (Quick Firing) Tests: Negative.

*Note: Mohs hardness values are based on M.E. Tyrrell's 1967 revisions of 1964 test data sheets.

Crushing Characteristics (unfired material) -

Particle Size -20 mesh. Retention Time 15 min. draw trials (following 3-4 hr. to 1800°F, 982°C).

Chemical & Mineralogical Data:

Chemical Analysis: Not determined.

Oxide	Weight %
SiO_2	
TiO_2	
Al_2O_3	
Fe_2O_3	
FeO	
MnO	
MgO	
CaO	
Na_2O	
K_2O	
P_2O_5	
S (total)	
C (org.)	
CO_2	
H_2O^-	
H_2O^+	
Ignition loss	
Total	

Mineralogy

Mineral	volume %
Quartz	X
Feldspar	-
Carbonate	-
Mica ("Hydrous")	X
Chlorite-vermiculite	-
Montmorillonite	-
Others	
"Kaolin"	X
"Iron"	3 to 7
Total	-

X = present in unspecified amounts.

Analyst H. P. Hamlin, USBM.

Date 10-21-57.

Method X-ray and petrographic analysis.

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. Rock Mountain (SE. 1/4). Lat. _____, Long. _____.

Field No. 13, Collected by Ray and Furcron. Date August 1957.

Sample Method Grab (?). Weathering/alteration -

Structural Attitude -

Stratigraphic Assignment Floyd Shale (Mississippian).

Sample Description & Comments Sample of Floyd Shale from pit operated by Oconee Clay Products Co. (about 600 x 50 ft. and 10-15 ft. deep) from the old Berryhill Estate (Fl.31S-8) about 1/2 mile W. of Berryhill Station, about 1/4 mile S. of the Central of Ga. RR. and Huffaker Rd. (Furcron, 1958, p., 5, No. 24). Also located just N. of pit operated by the Rome Brick Co. and E. of Atlanta Brick & Tile Co. pit (Furcron, 1958, p. 5, No. 23 and 25 respectively).

Compiled by B. J. O'Connor Date 3-10-86

CERAMIC TESTS AND ANALYSES

Material Shale, soft, sandy (Lavender Mbr.). Compilation Map Location No. F1.57-14

County Floyd. Sample Number 14.

Raw Properties: Lab & No. USBM; Norris, TN.; No. 858-N.

Date Reported 10-21-57. Ceramist H. P. Hamlin, USBM.

Water of Plasticity 18 % Working Properties Short, sandy-working, not plastic. Extrusion Char.: Not determined. pH = 8.50. Solu-Br. = 2.80.

Color Gray. Drying Shrinkage - % Dry Strength Very low.

Slow Firing Tests:

Temp. °F (°C)	Color	Hardness (Mohs')*	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data: App. Sp. Gr.
1800 (982)	(Disintegrated in water.)		-	-	-	-
2000 (1093)	Light buff	Soft (2)	2.5	24.0	-	2.39
2100 (1149)	Light buff	Soft (2)	2.5	16.9	-	2.13
2200 ("Melts of 2200") (1204)		-	-	-	-	-

Remarks / Other Tests No commercial possibilities. Petrographic analysis shows 25 to 30% calcium carbonate.

Preliminary Bloating (Quick Firing) Tests: Negative.

*Note: Mohs hardness values are based on M.E. Tyrrell's 1967 revisions of 1964 test data sheets.

Crushing Characteristics (unfired material) -

Particle Size -20 mesh. Retention Time 15 min. draw trials (following 3-4 hr. to 1800°F, 982°C).

Chemical & Mineralogical Data:

Chemical Analysis: Not determined.

Oxide	Weight %
SiO_2	
TiO_2	
Al_2O_3	
Fe_2O_3	
FeO	
MnO	
MgO	
CaO	
Na_2O	
K_2O	
P_2O_5	
S (total)	
C (org.)	
CO_2	
H_2O^-	
H_2O^+	
Ignition loss	
Total	

Mineralogy

Mineral	volume %
Quartz	X
Feldspar	-
Carbonate	25 to 30
Mica ("Hydrous")	X
Chlorite-vermiculite	-
Montmorillonite	-
Others	
"Kaolin"	X
"Iron"	3 to 7
Total	-

X = present in unspecified amounts.

Analyst _____ H. P. Hamlin, USBM.

Date _____ 10-21-57.

Method _____ X-ray and petrographic analysis.

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. Chattoogaville (SE. 1/4). Lat. _____, Long. _____.

Field No. 14, Collected by Ray and Furcron Date August 1957.

Sample Method Grab (?). Weathering/alteration -

Structural Attitude -

Stratigraphic Assignment Probably Lavender Shale Member, Ft. Payne Chert (Mississippian).

Sample Description & Comments Sample of green shale (Lavender Shale Member?) which "covers" the limestone ridge on the G. Henry property on King Creek, about 2 miles N. of Ga. Hwy. 20 in the extreme NW. corner of Floyd Co. (D. Ray, unpubl. notes, Aug. 1957, Ga. Geol. Survey files) near the Halls Mtn. locality of Furcron (1958, p. 3, No. 10) and Maynard (1912, p. 172, No.14).

Compiled by B. J. O'Connor Date 11-29-82

CERAMIC TESTS AND ANALYSES

Material Shale, soft (Conasauga). Compilation Map Location No. F1.57-15

County Floyd. Sample Number 15.

Raw Properties: Lab & No. USBM; Norris, TN.; No. 858-O.

Date Reported 10-21-57. Ceramist H. P. Hamlin, USBM.

Water of Plasticity 35 % Working Properties Plastic and smooth-working.
Extrusion Characteristics: Good. pH = 7.5. Solu-Br. = 5.15.

Color Light red. Drying Shrinkage 6.0 % Dry Strength Average.

Remarks No drying defects.

Slow Firing Tests:

Temp. °F (°C)	Color	Hardness (Mohs')*	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data: App. Sp. Gr.
1800 (982)	Buff	Soft, crumbly (2)	8.5	18.5	-	2.51
2000 (1093)	Orange-buff	Fair hard (3)	11.5	11.7	-	2.47
2100 (1149)	Red	Very hard (5)	15.5	5.8	-	2.43
2200 (1204)	Brown-red	Steel hard (6)	(Expanded)	1.3	-	2.07
2300 (1260)	Brown	Steel hard (6)	(Expanded)	3.1	-	1.39

Remarks / Other Tests Modulus of Rupture: 3200 psi. Commercial possibilities for brick and tile are good, although % shrinkage is rather high; color range is fair and maturing temperature is short, slightly above 2000°F (1093°C).

Preliminary Bloating (Quick Firing) Tests: Slight expansion.

*Note: Mohs hardness values are based on M.E. Tyrrell's 1967 revisions of 1964 test data sheets.

Crushing Characteristics (unfired material) -

Particle Size -20 mesh. Retention Time 15 min. draw trials (following 3-4 hr. to 1800°F, 982°C).

Chemical & Mineralogical Data:

Chemical Analysis: Not determined.

Oxide	Weight %
SiO_2	
TiO_2	
Al_2O_3	
Fe_2O_3	
FeO	
MnO	
MgO	
CaO	
Na_2O	
K_2O	
P_2O_5	
S (total)	
C (org.)	
CO_2	
H_2O^-	
H_2O^+	
Ignition loss	
Total	

Mineralogy

Mineral	volume %
Quartz	X
Feldspar	-
Carbonate	-
Mica ("Hydrous")	X
Chlorite-vermiculite	-
Montmorillonite	-
Others	
"Kaolin"	X
"Iron"	3 to 7
Total	-

Analyst _____ H. P. Hamlin, USBM.

Date _____ 10-21-57.

Method _____ X-ray and petrographic analysis.

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. Chattoogaville (SE. 1/4). Lat. _____, Long. _____.

Field No. 15, Collected by Ray and Furcron. Date August 1957.

Sample Method Grab (?). Weathering/alteration -

Structural Attitude -

Stratigraphic Assignment Conasuaga Group (Cambrian).

Sample Description & Comments Sample of Conasauga shale from roadcut on Ga. Hwy. 20, about 800 ft. E. of King Creek on the Davis and Bridges properties (Furcron, 1958, p. 6, No. 34 and D. Ray unpubl. notes, Aug. 1957, Ga. Geol.Survey files). This approximately corresponds to the "Evans and Russell properties" locality of Smith (1931, p. 103, No. 14) - see Fl.31S-14.

Compiled by B. J. O'Connor Date 3-10-86

CERAMIC TESTS AND ANALYSES

Material Shale, soft (Floyd). Compilation Map Location No. Fl.57-16

County Floyd. Sample Number 16.

Raw Properties: Lab & No. USBM; Norris, TN.; No. 858-P.

Date Reported 10-21-57. Ceramist H. P. Hamlin, USBM.

Water of Plasticity 24 % Working Properties Fairly plastic and smooth-working. Extrusion Characteristics: Fair. pH = 5.7. Solu-Br. = 0.98.

Color Light red. Drying Shrinkage 5 % Dry Strength Low.

Remarks No drying defects.

Slow Firing Tests:

Temp. °F (°C)	Color	Hardness (Mohs')*	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data: App. Sp. Gr.
1800 (982)	Buff	Soft, crumbly (2)	5.5	18.2	-	2.59
2000 (1093)	Buff	Fair hard (3)	6.0	14.3	-	2.56
2100 (1149)	Light red	Hard (4)	9.0	11.0	-	2.52
2200 (1204)	Red-brown	Very hard (5)	9.5	8.0	-	2.47
2300 (1260)	Brown	Steel hard (6)	11.0	3.9	-	2.38
2400 1316)	Brown-gray	Steel hard (6)	(Expanded)	1.5	-	2.14

Remarks / Other Tests Modulus of Rupture: 2000 psi. Commercial possibilities for brick and tile are good; maturing temperature for brick between 2100 and 2200°F (1149 and 1204°C); color range is fair.

Preliminary Bloating (Quick Firing) Tests: Negative.

*Note: Mohs hardness values are based on M.E. Tyrrell's 1967 revisions of 1964 test data sheets.

Crushing Characteristics (unfired material) -

Particle Size -20 mesh. Retention Time 15 min. draw trials (following 3-4 hr. to 1800°F, 982°C).

Chemical & Mineralogical Data:

Chemical Analysis: Not determined.

Oxide	Weight %
SiO_2	
TiO_2	
Al_2O_3	
Fe_2O_3	
FeO	
MnO	
MgO	
CaO	
Na_2O	
K_2O	
P_2O_5	
S (total)	
C (org.)	
CO_2	
H_2O^-	
H_2O^+	
Ignition loss	
Total	

Mineralogy

Mineral	volume %
Quartz	X
Feldspar	-
Carbonate	-
Mica ("Hydrous"	X
Chlorite-	-
vermiculite	
Montmorillonite	-
Others	
"Kaolin"	X
"Iron"	3 to 7
Total	-

X = present in unspecified amounts.

Analyst H. P. Hamlin, USBM.

Date 10-21-57.

Method X-ray and petrographic analysis.

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. Rome North (NE. 1/4) . Lat. _____, Long. _____.

Field No. 16 , Collected by Ray and Furcron Date August 1957.

Sample Method Grab (?). Weathering/alteration -

Structural Attitude -

Stratigraphic Assignment Floyd Shale (Mississippian).

Sample Description & Comments Sample of Floyd Shale from a small roadcut on Old Summerville Rd. (parallel to and W. of U. S. Hwy. 27) about 1.3 miles N. of Pleasant Valley Church (Furcron, 1958, p. 7, No. 37).

Compiled by B. J. O'Connor Date 3-10-86

CERAMIC TESTS AND ANALYSES

Material Shale, soft, sandy (Floyd). Compilation Map Location No. Fl.57-17

County Floyd. Sample Number 17.

Raw Properties: Lab & No. USBM; Norris, TN.; No. 858-Q.

Date Reported 10-21-57. Ceramist H. P. Hamlin, USBM.

Water of Plasticity 26 % Working Properties Very short and sandy-working.
Extrusion Characteristics: not determined. pH = 5.40. Solu-Br. = 0.54.

Color Brown. Drying Shrinkage 5 % Dry Strength Very low.

Remarks No drying defects.

Slow Firing Tests:

Temp. °F (°C)	Color	Hardness (Mohs')*	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data: App. Sp. Gr.
1800 (982)	Light buff	Soft, crumbly (2)	5.0	26.9	-	2.60
2000 (1093)	Light buff	Fair hard (3)	6.5	24.4	-	2.62
2100 (1149)	Light brown-red	Hard (4)	9.5	16.0	-	2.57
2200 (1204)	Brown-red	Very hard (5)	11.0	11.0	-	2.45
2300 (1260)	Gray-brown	Steel hard (6)	14.0	5.5	-	2.26
2400 (1316)	Gray	(Expanded)	(Expanded)	-	-	2.05

Remarks / Other Tests Commercial possibilities for brick and tile are poor.

Preliminary Bloating (Quick Firing) Tests: Negative.

*Note: Mohs hardness values are based on M.E. Tyrrell's 1967 revisions of 1964 test data sheets.

Crushing Characteristics (unfired material) -

Particle Size -20 mesh. Retention Time 15 min. draw trials (following 3-4 hr. to 1800°F, 982°C).

Chemical & Mineralogical Data:

Chemical Analysis: Not determined.

Oxide	Weight %
SiO_2	
TiO_2	
Al_2O_3	
Fe_2O_3	
FeO	
MnO	
MgO	
CaO	
Na_2O	
K_2O	
P_2O_5	
S (total)	
C (org.)	
CO_2	
H_2O^-	
H_2O^+	
Ignition loss	
Total	

Mineralogy

Mineral	volume %
Quartz	X
Feldspar	-
Carbonate	-
Mica ("Hydrous")	X
Chlorite-vermiculite	-
Montmorillonite	-
Others	
"Kaolin"	X
"Iron"	3 to 7
Total	-

X = present in specified amounts.

Analyst H. P. Hamlin, USBM.

Date 10-21-57.

Method X-ray and petrographic analysis.

Sample Location Data:

County Floyd. Land Lot , Sec. , Dist. .

7 1/2' topo quad. Armuchee (E. cntr.). Lat. , Long. .

Field No. 17, Collected by Ray and Furcron. Date August 1957.

Sample Method Grab (?). Weathering/alteration -

Structural Attitude -

Stratigraphic Assignment Floyd Shale (Mississippian).

Sample Description & Comments Sample of Floyd Shale from along Floyd Springs Rd., 0.2 mile S. of Floyd Springs Baptist Church, S. of Floyd Springs, about 0.4 mile N. of Turner Rd. (D. Ray, unpubl. notes, Aug. 1957, Ga. Geol. Survey files).

Compiled by B. J. O'Connor Date 3-10-86

CERAMIC TESTS AND ANALYSES

Material Shale, soft (Floyd). Compilation Map Location No. Fl.57-18

County Floyd. Sample Number 18.

Raw Properties: Lab & No. USBM; Norris, TN.; No. 858-R.

Date Reported 10-21-57. Ceramist H. P. Hamlin, USBM.

Water of Plasticity 24 % Working Properties Plastic and smooth-working.
Extrusion Characteristics : Fair. pH = 5.50. Solu-Br. = 0.46.

Color Light red. Drying Shrinkage 3.5 % Dry Strength Low.

Remarks No drying defects.

Slow Firing Tests:

Temp. °F (°C)	Color	Hardness (Mohs')*	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data: App. Sp. Gr.
1800 (982)	Light buff	Soft, crumbly (2)	5.5	18.6	-	2.67
2000 (1093)	Dark buff	Hard (4)	9.0	11.3	-	2.66
2100 (1149)	Red-brown	Steel hard (6)	10.0	7.1	-	2.59
2200 (1204)	Dark red-brown	Steel hard (6)	12.5	4.2	-	2.52
2300 (1260)	Brown	Steel hard (6)	14.0	2.1	-	2.32
2400 (1316)	Brown	Steel hard (6)	(Expanded)	13.0	-	2.22

Remarks / Other Tests Modulus of Rupture: 3500 psi. Commercial possibilities for brick and tile are good. Color range is good - would probably make quarry tile. (Same as "S"- Fl.57-19.)

Preliminary Bloating (Quick Firing) Tests: Negative.

*Note: Mohs hardness values are based on M.E. Tyrrell's 1967 revisions of 1964 test data sheets.

Crushing Characteristics (unfired material) -

Particle Size -20 mesh. Retention Time 15 min. draw trials (following 3-4 hr. to 1800°F, 982°C).

Chemical & Mineralogical Data:

Chemical Analysis: Not determined.

Oxide	Weight %
SiO_2	
TiO_2	
Al_2O_3	
Fe_2O_3	
FeO	
MnO	
MgO	
CaO	
Na_2O	
K_2O	
P_2O_5	
S (total)	
C (org.)	
CO_2	
H_2O^-	
H_2O^+	
Ignition loss	
Total	

Mineralogy

Mineral	volume %
Quartz	X
Feldspar	-
Carbonate	-
Mica ("Hydrous")	X
Chlorite-vermiculite	-
Montmorillonite	-
Others	
"Kaolin"	X
"Iron"	3 to 7
Total	-

X = present in unspecified amounts.

Analyst H. P. Hamlin, USBM.

Date 10-21-57.

Method X-ray and petrographic analysis.

Sample Location Data:

County Floyd. Land Lot , Sec. , Dist. .

7 1/2' topo quad. Plainville (W. side) . Lat. , Long. .

Field No. 18 , Collected by Ray and Furcron. Date August 1957.

Sample Method Grab (?). Weathering/alteration -

Structural Attitude -

Stratigraphic Assignment Floyd Shale (Mississippian).

Sample Description & Comments Sample of Floyd Shale from along Rosedale Rd., about 0.3 mile W. of Rosedale and Old Dalton Rd., E. of Muck Creek (Furcron, 1958, p. 7, No. 38).

Compiled by B. J. O'Connor Date 3-10-86

CERAMIC TESTS AND ANALYSES

Material Shale, soft (Lavender Mbr.?) Compilation Map Location No. F1.57-19

County Floyd. Sample Number 19.

Raw Properties: Lab & No. USNM; Norris TN.; No. 858-S.

Date Reported 10-21-57. Ceramist H. P. Hamlin, USBM.

Water of Plasticity 25 % Working Properties Plastic and smooth-working.
Extrusion Characteristics: Good. pH = 5.1. Solu-Br. = 0.63.

Color Light red. Drying Shrinkage 5 % Dry Strength Very low.

Remarks No drying defects.

Slow Firing Tests:

Temp. °F (°C)	Color	Hardness (Mohs')*	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data: App. Sp. Gr.
1800 (982)	Buff	Soft. crumbly (2)	5.5	19.9	-	2.60
2000 (1093)	Dark buff	Fair hard (3)	7.5	10.9	-	2.58
2100 (1149)	Red	Steel hard (6)	10.0	6.3	-	2.52
2200 (1204)	Dark red-brown	Steel hard (6)	12.5	4.4	-	2.46
2300 (1260)	Brown	Steel hard (6)	14.0	2.9	-	2.40
2400 (1316)	Brown	Steel hard (6)	(Expanded)	-	-	2.25

Remarks / Other Tests Modulus of Rupture: 2400 psi. Commercial possibilities for brick and tile are very good. Has good color range and would probably make quarry tile. (Same as "R" = F1.57-18.)

Preliminary Bloating (Quick Firing) Tests: Negative.

*Note: Mohs hardness values are based on M.E. Tyrrell's 1967 revisions of 1964 test data sheets.

Crushing Characteristics (unfired material) -

Particle Size -20 mesh. Retention Time 15 min. draw trials (following 3-4 hr. to 1800°F, 982°C).

Chemical & Mineralogical Data:

Chemical Analysis: Not determined.

Oxide	Weight %
SiO_2	
TiO_2	
Al_2O_3	
Fe_2O_3	
FeO	
MnO	
MgO	
CaO	
Na_2O	
K_2O	
P_2O_5	
S (total)	
C (org.)	
CO	
H_2O^-	
H_2O^+	
Ignition loss	
Total	

Mineralogy

Mineral	volume %
Quartz	X
Feldspar	-
Carbonate	-
Mica ("Hydrous")	X
Chlorite-vermiculite	-
Montmorillonite	-
Others	
"Kaolin"	X
"Iron"	3 to 7
Total	-

X = present in unspecified amounts.

Analyst H. P.Hamlin, USBM.

Date 10-21-57.

Method X-ray and petrographic analysis.

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. Armuchee (SE. corner). Lat. _____, Long. _____.

Field No. 19, Collected by Ray and Furcron Date August 1957.

Sample Method Grab (?). Weathering/alteration -

Structural Attitude -

Stratigraphic Assignment Probably Lavender Shale Mbr., Ft. Payne Chert (Mississippian).

Sample Description & Comments Shale sample, probably from the Lavender Shale Member (Ft. Payne Chert), from along Old Dalton Rd. (parallel to and E. of Turkey Mtn.) near the intersection with Ga. Hwy. 140, about 1.5 miles N. of Armuchee Creek (Furcron, 1958, p. 7, No. 39), about 1/3 mile W. of the Oostanaula River.

Compiled by B. J. O'Connor Date 3-10-86

CERAMIC TESTS AND ANALYSES

Material Shale (Conasauga). Compilation Map Location No. Fl.60-1a to f.

County Floyd. Sample Number No. 1 to 6.

Raw Properties: Lab & No. USBM, Norris, TN; #1202 A to F.

Date Reported 3-25-60. Ceramist H. P. Hamlin, USBM.

Water of Plasticity - % Working Properties -

Color - Drying Shrinkage - % Dry Strength -

Slow Firing Tests: Not determined.

Temp. °F (°C)	Color	Hardness	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data:

Preliminary Bloating (Quick Firing) Tests: Negative: A and B; Positive: C to F.

Temp. °F (°C)	Bulk Denisty Lb/Ft^3	Absorption %	Remarks
USBM No. 1202A (No. 1) Type: Soft shale Crushing characteristics: Fair			
1800 (982)	91.6	18.6	No bloating
1900 (1038)	91.6	19.9	No bloating
2000 (1093)	110.3	9.5	No bloating
2100 (1149)	94.8	3.1	No bloating
2200 (1204)	94.8	1.0	Overfired and sticky
USBM No. 1202B (No. 2) Type: Soft shale Crushing characteristics: Fair			
1800 (982)	128.9	8.4	No bloating
1900 (1038)	115.3	7.3	No bloating
2000 (1093)	89.7	7.7	No bloating
2100 (1149)	94.0	4.3	No bloating
2200 (1204)	81.6	5.1	No bloating

Preliminary Bloating (Quick Firing) Tests: contd.

Temp. °F (°C)	Bulk Denisty Lb/Ft^3	Absorption %	Remarks
USBM No. 1202C (No. 3) Type: Soft shale Crushing characteristics: Good			
1800 (982)	123.3	3.6	Slight bloating
1900 (1038)	109.6	5.0	Slight bloating
2000 (1093)	94.7	3.3	Fair bloating
2100 (1149)	65.0	2.4	Fair bloating, slighty sticky
2200 (1204)	67.2	3.4	Overfired, very sticky
USBM No. 1202D (No. 4) Type: Soft shale Crushing characteristics: Good			
1800 (982)	112.1	5.8	No bloating
1900 (1038)	99.1	6.9	No bloating
2000 (1093)	91.6	6.0	Slight bloating
2100 (1149)	76.0	5.4	Fair bloating
2200 (1204)	79.1	1.6	Overfired and very sticky
USBM No. 1202E (No. 5) Type: Shale Crushing characteristics: Good			
1800 (982)	115.2	3.8	No bloating
1900 (1038)	99.7	5.9	No bloating
2000 (1093)	90.3	4.4	Slight bloating
2100 (1149)	74.8	5.0	Fair bloating
2200 (1204)	74.0	3.8	Overfired, very sticky
USBM No. 1202F (No. 6) Type: Shale, hard Crushing characteristics: Very good			
1800 (982)	107.2	4.1	No bloating
1900 (1038)	91.6	4.7	No bloating
2000 (1093)	81.0	4.5	Slight bloating
2100 (1149)	72.3	3.3	Fair bloating
2200 (1204)	69.2	2.9	Overfired and very sticky

locn. no. Fl.60-1 a to f, cont.

Crushing Characteristics (unfired material) Fair to very good.

Particle Size 1/4 x 1/2 in. Retention Time 15 minutes.

Chemical & Mineralogical Data: Not determined.

Sample Location Data:

County Floyd. Land Lot 5, Sec. _____, Dist. 22.

7 1/2' topo quad. Rome South (cntr.). Lat. _____, Long. _____.

Field No. (1 to 6), Collected by J. P. Roberts. Date 2-25-60.

Sample Method Grab (?). Weathering/alteration -

Structural Attitude -

Stratigraphic Assignment Conasauga Group (Cambrian) shale.

Sample Description & Comments Samples of shale collected from different points on the J. P. Roberts property 5 1/2 miles south of Rome and 1/8 mile north of the intersection of U. S. Highways 27 and 411.

"Samples 1 and 2 do not expand and they would not be suitable for aggregate.

"Samples 3, 4, 5 and 6 appear to be quite similar in composition and the bloating characteristics are about the same. A microscopic examination of the expanded particles showed that sample 3 gave the most uniform expansion and would probably make better aggregate than any of the other samples.

"Although the expanded weights of these shales are a little on the heavy side, the percent absorption is very low and the strength of the aggregate is much better than that of most commercial materials.

"The results of these tests are positive enough to warrant further work and pilot plant size rotary kiln tests should be made on larger samples." (H. P. Hamlin, written communication, 3-25-60).

Compiled by B. J. O'Connor Date 11-29-82

CERAMIC TESTS AND ANALYSES

Material Shale (Floyd). Compilation Map Location No. F1.64-1

County Floyd. Sample Number 25.

Raw Properties: Lab & No. USBM, Norris, Tenn.; No. 1553-W.

Date Reported 4-8-64 (revised 1967) Ceramist M. V. Denny, USBM (revised by M. E. Tyrrell, Tuscaloosa, Ala.)

Water of Plasticity 26.8 % Working Properties (Moderate plasticity.) Long working, plastic, smooth, fatty. pH = 5.78 (Not effervescent with HCl.)

Color Tan. Drying Shrinkage 4.0 % Dry Strength Good. (Fair.)

Remarks Drying Characteristics: Good (No defects.)

Slow Firing Tests:

Temp. °F (°C)	Color	Hardness (Mohs')	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data: Bulk Dens., gm/cc
1800 (982)	Red-tan	Fair hard (3)	5.0	23.6	39.4	1.67
1900 (1038)	Red-tan	Fair hard (3)	5.0	21.2	36.7	1.73
2000 (1093)	Reddish-brown	Hard (4)	9.5(9.0)	15.2	29.0	1.91
2100 (1149)	Reddish-brown	Very hard (5)	10.0	12.9	25.5	1.98
2200 (1204)	Brown	Steel hard (6)	12.5	9.6	20.0	2.08
2300 (1260)	Dark brown	Steel hard (6)	12.5	9.9	20.9	2.11

Remarks / Other Tests (Should fire to "MW" face brick specifications at about 2100°F, 1149°C.) Fair color, slightly rough surface, some cracks in firing. Temperature a little high for brick. Potential Use: Brick? (Face brick.)

Preliminary Bloating (Quick Firing) Tests: Negative.

Note: Appr. Por. and Bulk Dens. plus data and remarks in parentheses are from 1967 revised data sheets by Tyrrell.

Crushing Characteristics (unfired material) -

Particle Size -20 mesh. Retention Time 15 min. draw trials (following 3-4 hr. to 1800°F, 982°C).

Chemical & Mineralogical Data: Not determined.

Chemical Analysis		Mineralogy	
Oxide	Weight %	Mineral	volume %
SiO_2			
TiO_2		Quartz	
Al_2O_3		Feldspar	
Fe_2O_3		Carbonate	
FeO		Mica	
MnO		Chlorite-vermiculite	
MgO		Montmorillonite	
CaO		Others	
Na_2O			
K_2O			
P_2O_5			
S (total)		Total	
C (org.)			
CO_2			
H_2O^-			
H_2O^+			
Ignition loss			
Total			

Analyst _____ _____

Date _____ _____

Method _____ _____

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. - . Lat. _____, Long. _____.

Field No. 25. , Collected by J.W.Smith ? Date c. 1963.

Sample Method Grab (?). Weathering/alteration -

Structural Attitude -

Stratigraphic Assignment Floyd Shale (Mississippian).

Sample Description & Comments No further data available.

Compiled by B. J. O'Connor Date 5-1-84

CERAMIC TESTS AND ANALYSES

Material Shale (Conasauga). Compilation Map Location No. F1.64-2

County Floyd. Sample Number 30.

Raw Properties: Lab & No. USBM, Norris, Tenn.; No. 1554-B.

Date Reported 5-8-64 (revised 1967) Ceramist M. V. Denny, USBM (revised by M. E. Tyrrell, Tuscaloosa, Ala.)

Water of Plasticity 27.5 % Working Properties (Low plasticity.) Long working, plastic, smooth, fatty. pH = 6.05 (Not effervescent with HCl.)

Color Red-buff. Drying Shrinkage 0.5 (0.0)% Dry Strength (Low.) Good.

Remarks Drying Characteristics: (No defects.) Surface crazing.

Slow Firing Tests:

Temp. °F (°C)	Color	Hardness (Mohs')	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data: Bulk Dens. gm/cc
1800 (982)	Light brown	Soft (2)	1.0	20.4	35.5	1.74
1900 (1038)	Light brown	Fair hard (3)	5.5(5.0)	15.2	29.0	1.91
2000 (1093)	Brown	Hard (4)	9.0	7.7	17.0	2.21
2100 (1149)	Chocolate	Very hard (5)	15.0	4.4	10.3	2.34
2200 (1204)	Dark brown	Steel hard (6)	15.0	1.2	3.0	2.43
2300 (1260)	Dark brown	Steel hard (6)	15.0 (Expanded)	0.5	-	-

Remarks / Other Tests (Should fire to "SW" face brick specifications at about 2000°F, 1093°C. Abrupt vitrification.) Fair color, absorption high. Potential Use: (Face brick, sewer pipe, and quarry tile.) Brick.

Preliminary Bloating (Quick Firing) Tests: Negative.

Note: Appr. Por. and Bulk Dens. plus data and remarks in parentheses are from 1967 revised data sheets by Tyrrell.

Crushing Characteristics (unfired material) -

Particle Size -20 mesh. Retention Time 15 min. draw trials (following 3-4 hr. to 1800°F, 982°C).

Chemical & Mineralogical Data: Not determined.

Chemical Analysis		Mineralogy	
Oxide	Weight %	Mineral	volume %
SiO_2			
TiO_2		Quartz	
Al_2O_3		Feldspar	
Fe_2O_3		Carbonate	
FeO		Mica	
MnO		Chlorite-vermiculite	
MgO		Montmorillonite	
CaO		Others	
Na_2O			
K_2O			
P_2O_5			
S (total)		Total	
C (org.)			
CO_2			
H_2O^-			
H_2O^+			
Ignition loss			
Total			

Analyst _____ _____

Date _____ _____

Method _____ _____

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. -. Lat. _____, Long. _____.

Field No. 30., Collected by J.W. Smith ? Date c. 1963.

Sample Method Grab (?). Weathering/alteration -

Structural Attitude -

Stratigraphic Assignment Conasauga Group (Cambrian).

Sample Description & Comments No further data available.

Compiled by B. J. O'Connor Date 5-1-84

CERAMIC TESTS AND ANALYSES

Material Shale (Conasauga). Compilation Map Location No. F1.64-3

County Floyd. Sample Number 33.

Raw Properties: Lab & No. USBM, Norris, Tenn.; No. 1554-E.

Date Reported 5-8-64 (revised 1967) Ceramist M. V. Denny, USBM (revised by M. E. Tyrrell, Tuscaloosa, Ala.)

Water of Plasticity 30.4 % Working Properties (Moderate plasticity.) Short working, mealy, gritty. pH = 5.99. (Not effervescent with HCl.)

Color Yellow. Drying Shrinkage 5.0 % Dry Strength Poor. (Fair.)

Remarks Drying Characteristics: Poor-rough. (No defects.)

Slow Firing Tests:

Temp. °F (°C)	Color	Hardness (Mohs')	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data: Bulk Dens. gm/cc
1800 (982)	Tan	Soft (2)	4.5(5.0)	33.7	47.5	1.41
1900 (1038)	Tan	Soft (2)	4.5(5.0)	31.1	45.4	1.46
2000 (1093)	Tan	Fair hard (3)	4.5(5.0)	30.7	44.8	1.46
2100 (1149)	Light brown	Fair hard (3)	5.5(5.0)	30.1	44.5	1.48
2200 (1204)	Red-brown	Hard (4)	4.5(5.0)	29.9	43.7	1.46
2300 (1260)	Red-brown	Hard (4)	5.5(5.0)	23.1	37.0	1.60

Remarks / Other Tests Very high absorption, (at all firing temperatures), poor color, too soft; some carbonate and sulfate. Potential Use: None. (Not suitable for use as the principal component in vitreous clay products.)

Preliminary Bloating (Quick Firing) Tests: Negative.

Note: Appr. Por. and Bulk Dens. plus data and remarks in parentheses are from 1967 revised data sheets by Tyrrell.

Crushing Characteristics (unfired material) -

Particle Size -20 mesh. Retention Time 15 min. draw trials (following 3-4 hr. to 1800°F, 982°C).

Chemical & Mineralogical Data: Not determined.

Chemical Analysis		Mineralogy	
Oxide	Weight %	Mineral	volume %
SiO_2			
TiO_2		Quartz	
Al_2O_3		Feldspar	
Fe_2O_3		Carbonate	
FeO		Mica	
MnO		Chlorite-vermiculite	
MgO		Montmorillonite	
CaO		Others	
Na_2O			
K_2O			
P_2O_5			
S (total)		Total	
C (org.)			
CO_2			
H_2O^-			
H_2O^+			
Ignition loss			
Total			

Analyst _____ _____

Date _____ _____

Method _____ _____

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. -. Lat. _____, Long. _____.

Field No. 33., Collected by J.W. Smith ? Date c. 1963.

Sample Method Grab (?). Weathering/alteration -

Structural Attitude -

Stratigraphic Assignment Conasauga Group (Cambrian).

Sample Description & Comments No further data available.

Compiled by B. J. O'Connor Date 5-1-84

CERAMIC TESTS AND ANALYSES

Material Shale (Floyd). Compilation Map Location No. F1.64-4

County Floyd. Sample Number 41.

Raw Properties: Lab & No. USBM, Norris, Tenn.; No. 1554-M.

Date Reported 5-8-64 (revised 1967) Ceramist M. V. Denny, USBM (revised by M. E. Tyrrell, Tuscaloosa, Ala.)

Water of Plasticity 25.0 % Working Properties (Low plasticity.) Long working, plastic, smooth, fatty. pH = 5.90. (Not effervescent with HCl.)

Color Tan. Drying Shrinkage 2.5 % Dry Strength Fine. (Low.)

Remarks Drying Characteristics: (No defects.) Good; slight surface crazing.

Slow Firing Tests:

Temp. °F (°C)	Color	Hardness (Mohs')	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data: Bulk Dens. gm/cc
1800 (982)	Flesh	Fair hard (3)	2.5	21.5	36.6	1.70
1900 (1038)	Tan	Hard (4)	5.0	17.7	32.2	1.82
2000 (1093)	Light brown	Hard (4)	7.5	15.0	28.7	1.91
2100 (1149)	Brown	Very hard (5)	10.0	14.1	27.2	1.93
2200 (1204)	Dark red-brown	Very hard (5)	11.0	5.4	11.9	2.21
2300 (1260)	Dark brown	Steel hard (6)	11.0	2.8	6.4	2.29

Remarks / Other Tests (Abrupt vitrification. Should fire to "SW" face brick specifications at about 2150°F, 1177°C). Potential Use: (Face brick; sewer pipe.) Decorative brick, tile and pottery.

Preliminary Bloating (Quick Firing) Tests: Negative.

Note: Appr. Por. and Bulk Dens. plus data and remarks in parentheses are from 1967 revised data sheets by Tyrrell.

Crushing Characteristics (unfired material) -

Particle Size -20 mesh. Retention Time 15 min. draw trials (following 3-4 hr. to 1800°F, 982°C).

Chemical & Mineralogical Data: Not determined.

Chemical Analysis		Mineralogy	
Oxide	Weight %	Mineral	volume %
SiO_2			
TiO_2		Quartz	
Al_2O_3		Feldspar	
Fe_2O_3		Carbonate	
FeO		Mica	
MnO		Chlorite-vermiculite	
MgO		Montmorillonite	
CaO		Others	
Na_2O			
K_2O			
P_2O_5			
S (total)		Total	
C (org.)			
CO_2			
H_2O^-			
H_2O^+			
Ignition loss			
Total			

Analyst _____ _____

Date _____ _____

Method _____ _____

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. -. Lat. _____, Long. _____.

Field No. 41., Collected by J.W. Smith ? Date c. 1963.

Sample Method Grab (?). Weathering/alteration -

Structural Attitude -

Stratigraphic Assignment Floyd Shale (Mississippian).

Sample Description & Comments No further data available.

Compiled by B. J. O'Connor Date 5-1-84

CERAMIC TESTS AND ANALYSES

Material Shale (Floyd). Compilation Map Location No. F1.64-5

County Floyd. Sample Number 50.

Raw Properties: Lab & No. USBM, Norris, Tenn.; No. 1554-V.

Date Reported 5-8-64 (revised 1967) Ceramist M. V. Denny, USBM (revised by M. E. Tyrrell, Tuscaloosa, Ala.)

Water of Plasticity - % Working Properties (Low plasticity.) Short working, smooth, plastic. pH = 5.40 (Not effervescent with HCl.)

Color Yellow. Drying Shrinkage (0.0)% Dry Strength (Low.)

Remarks Drying Characteristics: Good (No defects.)

Slow Firing Tests:

Temp. °F (°C)	Color	Hardness (Mohs')	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data: Bulk Dens. gm/cc
1800 (982)	Light tan	Fair hard (3)	1.0	20.3	33.5	1.65
1900 (1038)	Light tan	Fair hard (3)	1.0	19.0	32.1	1.69
2000 (1093)	Light tan	Hard (4)	1.0	16.8	29.4	1.75
2100 (1149)	Light brown	Very hard (5)	5.0	13.2	24.6	1.36
2200 (1204)	Light brown	Very hard (5)	5.0	13.1	24.5	1.37
2300 (1260)	Choco-late	Steel hard (6)	5.0	10.9	21.1	1.94

Remarks / Other Tests Good color, absorption high, spotty surface. (Should fire to "MW" face brick specifications at about 2050°F, 1121°C). Potential Use: (Face brick.) Decorative brick or tile.

Preliminary Bloating (Quick Firing) Tests: Negative.

Note: Appr.Por. and Bulk Dens. plus data and remarks in parentheses are from 1967 revised data sheets by Tyrell.

Crushing Characteristics (unfired material) -

Particle Size -20 mesh. Retention Time 15 min. draw trials (following 3-4 hr. to 1800°F, 982°C).

Chemical & Mineralogical Data: Not determined.

Chemical Analysis		Mineralogy	
Oxide	Weight %	Mineral	volume %
SiO_2			
TiO_2		Quartz	
Al_2O_3		Feldspar	
Fe_2O_3		Carbonate	
FeO		Mica	
MnO		Chlorite- · vermiculite	
MgO		Montmorillonite	
CaO		Others	
Na_2O			
K_2O			
P_2O_5			
S (total)		Total	
C (org.)			
CO_2			
H_2O^-			
H_2O^+			
Ignition loss			
Total			

Analyst _____ _____

Date _____ _____

Method _____ _____

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. -. Lat. _____, Long. _____.

Field No. 50., Collected by J.W. Smith ? Date c. 1963.

Sample Method Grab (?). Weathering/alteration -

Structural Attitude -

Stratigraphic Assignment Floyd Shale (Mississippian).

Sample Description & Comments No further data available.

Compiled by B. J. O'Connor Date 5-1-84

CERAMIC TESTS AND ANALYSES

Material Shale (Floyd). Compilation Map Location No. Fl.64-6

County Floyd. Sample Number 51.

Raw Properties: Lab & No. USBM, Norris, Tenn.; No. 1554-W.

Date Reported 4-8-64 (revised 1967) Ceramist M. V. Denny, USBM (revised by M. E. Tyrrell, Tuscaloosa, Ala.)

Water of Plasticity 22.8 % Working Properties (Low plasticity.) Short working, smooth, plastic. pH = 5.73 (Not effervescent with HCl.)

Color Red-buff. Drying Shrinkage 4.0 % Dry Strength Good. (Low.)

Remarks Drying Characteristics: Good. (No defects.)

Slow Firing Tests:

Temp. °F (°C)	Color	Hardness (Mohs')	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data: Bulk Dens. gm/cc
1800 (982)	Tan	Fair hard (3)	1.0(5.0)	22.7	36.5	1.61
1900 (1038)	Tan	Hard (4)	5.0	19.3	33.0	1.71
2000 (1093)	Tan	Hard (4)	9.0	14.6	27.0	1.85
2100 (1149)	Choco-late	Very hard (5)	9.0	8.5(9.1)	18.4	2.01
2200 (1204)	Brown	Very hard (5)	10.0	9.1(3.5)	17.1	2.02
2300 (1260)	Dark purple-brown	Steel hard (6)	11.0	3.1	6.8	2.19

Remarks / Other Tests Fine color, spotted, shrinkage slightly high. Needs plastic additive to make a fine pottery and stoneware clay. (Should fire to "SW" face brick specifications at about 2100°F, 1149°C). Potential Use: (Face brick; sewer pipe.) Decorative brick and tile.

Preliminary Bloating (Quick Firing) Tests: Negative.

Note: Appr.Por. and Bulk Dens. plus data and remarks in parentheses are from 1967 revised data sheets by Tyrrell.

Crushing Characteristics (unfired material) -

Particle Size -20 mesh. Retention Time 15 min. draw trials (following 3-4 hr. to 1800°F, 982°C).

Chemical & Mineralogical Data: Not determined.

Chemical Analysis		Mineralogy	
Oxide	Weight %	Mineral	volume %
SiO_2			
TiO_2		Quartz	
Al_2O_3		Feldspar	
Fe_2O_3		Carbonate	
FeO		Mica	
MnO		Chlorite-vermiculite	
MgO			
CaO		Montmorillonite	
Na_2O		Others	
K_2O			
P_2O_5			
S (total)		Total	
C (org.)			
CO_2			
H_2O^-			
H_2O^+			
Ignition loss			
Total			

Analyst _____ _____

Date _____ _____

Method _____ _____

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. -. Lat. _____, Long. _____.

Field No. 51., Collected by J.W.Smith ? Date c. 1963.

Sample Method Grab (?), Weathering/alteration -

Structural Attitude -

Stratigraphic Assignment Floyd Shale (Mississippian).

Sample Description & Comments No further data available.

Compiled by B. J. O'Connor Date 5-1-84

CERAMIC TESTS AND ANALYSES

Material Shale (Floyd). Compilation Map Location No. F1.64-7

County Floyd. Sample Number 52.

Raw Properties: Lab & No. USBM, Norris, Tenn.; No. 1554-X.

Date Reported 5-8-64 (revised 1967) Ceramist M. V. Denny, USBM (revised by M. E. Tyrrell, Tuscaloosa, Ala.)

Water of Plasticity 23.6 % Working Properties (Low plasticity) Short working, smooth, plastic. pH = 5.92 (Not effervescent with HCl.)

Color Dark gray. Drying Shrinkage 4.0 % Dry Strength (Low.) Good.

Remarks Drying Characteristics: Good, color slightly uneven. (No defects.)

Slow Firing Tests:

Temp. °F (°C)	Color	Hardness (Mohs')	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data: Bulk Dens. gm/cc
1800 (982)	Flesh, mottled	Fair hard (3)	2.5(5.0)	25.5	39.0	1.53
1900 (1038)	Flesh, mottled	Hard (4)	5.0	18.7	31.6	1.69
2000 (1093)	Flesh, brown	Very hard (5)	11.0	9.9	19.5	1.97
2100 (1149)	Light gray	Very hard (5)	11.0	6.7	13.9	2.07
2200 (1204)	Light gray	Steel hard (6)	12.5	2.9	6.3	2.17
2300 (1260)	Light gray	Steel hard (6)	14.5 (Expanded)	2.9	-	-

Remarks / Other Tests (Should fire to "SW" face brick specifications at about 2050°F, 1121°C). Too high shrinkage at higher temp. Could be added to another clay having lower shrinkage and higher absorption. Potential Use: (Face brick.)None - without additives.

Preliminary Bloating (Quick Firing) Tests: Negative.

Note: Appr.Por. and Bulk Dens. plus data and remarks in parentheses are from 1967 revised data sheets by Tyrrell.

Crushing Characteristics (unfired material) -

Particle Size -20 mesh. Retention Time 15 min. draw trials (following 3-4 hr. to 1800°F, 982°C).

Chemical & Mineralogical Data: Not determined.

Chemical Analysis		Mineralogy	
Oxide	Weight %	Mineral	volume %
SiO_2			
TiO_2		Quartz	
Al_2O_3		Feldspar	
Fe_2O_3		Carbonate	
FeO		Mica	
MnO		Chlorite-vermiculite	
MgO		Montmorillonite	
CaO		Others	
Na_2O			
K_2O			
P_2O_5			
S (total)		Total	
C (org.)			
CO_2			
H_2O^-			
H_2O^+			
Ignition loss			
Total			

Analyst _____ _____

Date _____ _____

Method _____ _____

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. -, Lat. _____, Long. _____.

Field No. 52., Collected by J.W. Smith ? Date c. 1963.

Sample Method Grab (?). Weathering/alteration -

Structural Attitude -

Stratigraphic Assignment Floyd Shale (Mississippian).

Sample Description & Comments No further data available.

Compiled by B. J. O'Connor Date 5-1-84

CERAMIC TESTS AND ANALYSES

Material Shale (Floyd). Compilation Map Location No. Fl.64-8

County Floyd. Sample Number 53.

Raw Properties: Lab & No. USBM, Norris, Tenn.; No. 1554-Y.

Date Reported 5-8-64 (revised 1967) Ceramist M. V. Denny, USBM (revised by M. E. Tyrrell, Tuscaloosa, Ala.)

Water of Plasticity 24.6 % Working Properties (Moderate plasticity.) Short working, smooth, plastic. pH = 5.90 (Not effervescent with HCl.)

Color Gray. Drying Shrinkage 5.0 % Dry Strength Good. (Fair.)

Remarks Drying Characteristics: Good. (No defects.)

Slow Firing Tests:

Temp. °F (°C)	Color	Hardness (Mohs')	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data: Bulk Dens.
1800 (982)	Tan	Hard (4)	5.5(5.0)	23.2	36.9	1.59
1900 (1038)	Tan	Hard (4)	8.5(8.0)	19.8	33.5	1.69
2000 (1093)	Light brown	Very hard (5)	10.0	15.3	27.8	1.82
2100 (1149)	Choco-late	Steel hard (6)	14.0	7.5	15.5	2.06
2200 (1204)	Dark brown	Steel hard (6)	15.0	6.3	13.0	2.07
2300 (1260)	Dark purple-brown	Steel hard (6)	15.0	3.5	7.6	2.16

Remarks / Other Tests (Should fire to "MW" face brick specifications at about 2050°F, 1121°C. Abrupt vitrification.) Shrinkage high, color good; needs plastic additive for stoneware and pottery use. Potential Use: (Face brick; sewer pipe.) Decorative brick and tile, flue tile.

Preliminary Bloating (Quick Firing) Tests: Positive.(Negative.)

Temp. °F (°C)	Absorption %	Bulk Density g/cm^3	Bulk Density lb/ft^3	Remarks: Shaly crushing
2000 (1093)	6.6	1.96	122	Shaly bloating.
2100 (1149)	8.2	1.49	93	Irregular bloating.
2200 (1204)	7.1	1.49	93	Irregular bloating.
2300 (1260)	7.5	1.25	78	Irregular bloating.

Remarks Probably fair lightweight aggregate - a little heavy.

Note: Appr.Por. and Bulk Dens. plus data and remarks in parentheses are from 1967 revised data sheets by Tyrrell.

Crushing Characteristics (unfired material) -

Particle Size -20 mesh. Retention Time 15 min. draw trials (following 3-4 hr. to 1800°F, 982°C).

Chemical & Mineralogical Data: Not determined.

Chemical Analysis		Mineralogy	
Oxide	Weight %	Mineral	volume %
SiO_2			
TiO_2		Quartz	
Al_2O_3		Feldspar	
Fe_2O_3		Carbonate	
FeO		Mica	
MnO		Chlorite-vermiculite	
MgO		Montmorillonite	
CaO		Others	
Na_2O			
K_2O			
P_2O_5			
S (total)		Total	
C (org.)			
CO_2			
H_2O^-			
H_2O^+			
Ignition loss			
Total			

Analyst _____ _____

Date _____ _____

Method _____ _____

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. -. Lat. _____, Long. _____.

Field No. 53., Collected by J.W. Smith ? Date c. 1963.

Sample Method Grab (?). Weathering/alteration -

Structural Attitude -

Stratigraphic Assignment Floyd Shale (Mississippian).

Sample Description & Comments No further data available.

Compiled by B. J. O'Connor Date 5-1-84

CERAMIC TESTS AND ANALYSES

Material Shale (Lavender Mbr.). Compilation Map Location No. F1.64-9

County Floyd. Sample Number 55.

Raw Properties: Lab & No. USBM, Norris, Tenn.; No. 1554-Z.

Date Reported 5-8-64 (revised 1967) Ceramist M. V. Denny, USBM (revised by M. E. Tyrrell, Tuscaloosa, Ala.)

Water of Plasticity 25.0 % Working Properties (Moderate plasticity.) Short working, smooth, plastic. pH = 5.39 (Not effervescent with HCl.)

Color Light gray. Drying Shrinkage 4.5(4.0)% Dry Strength Good. (Fair.)

Remarks Drying Characteristics: Good. Slight color variation. (No defects.)

Slow Firing Tests:

Temp. °F (°C)	Color	Hardness (Mohs')	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data: Bulk Dens. gm/cc
1800 (982)	Flesh	Fair hard (3)	2.5(5.0)	24.3	37.4	1.54
1900 (1038)	Flesh	Hard (4)	5.5(5.0)	19.2	31.7	1.65
2000 (1093)	Light brown	Very hard (5)	10.0	10.2	19.4	1.90
2100 (1149)	Red-gray	Very hard (5)	11.0	9.0	17.2	1.91
2200 (1204)	Gray	Steel hard (6)	11.0	4.8	9.5	1.98
2300 (1260)	Light gray	Steel hard (6)	5.5 (Expanded)	4.9	-	-

Remarks / Other Tests (Should fire to "MW" face brick specifications at about 1950°F, 1066°C.) Shrinkage high, fine color. With a plastic additive it would make a fine pottery and stoneware clay. Potential Use: (Face brick.) Decorative brick and tile.

Preliminary Bloating (Quick Firing) Tests: Positive.*(Negative.)

Temp. °F (°C)	Absorption %	Bulk Density g/cm^3	Bulk Density lb/ft^3	Remarks

* Remarks Temperature of bloating too high for lightweight aggregate.

Note: Appr.Por. and Bulk Dens. plus data and remarks in parentheses are from 1967 revised data sheets by Tyrrell.

Crushing Characteristics (unfired material) -

Particle Size -20 mesh. Retention Time 15 min. draw trials (following 3-4 hr. to 1800°F, 982°C).

Chemical & Mineralogical Data: Not determined.

Chemical Analysis		Mineralogy	
Oxide	Weight %	Mineral	volume %
SiO_2			
TiO_2		Quartz	
Al_2O_3		Feldspar	
Fe_2O_3		Carbonate	
FeO		Mica	
MnO		Chlorite-vermiculite	
MgO		Montmorillonite	
CaO		Others	
Na_2O			
K_2O			
P_2O_5			
S (total)		Total	
C (org.)			
CO_2			
H_2O^-			
H_2O^+			
Ignition loss			
Total			

Analyst _____ _____

Date _____ _____

Method _____ _____

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. -. Lat. _____, Long. _____.

Field No. 55., Collected by J.W. Smith ? Date c. 1963.

Sample Method Grab (?). Weathering/alteration -

Structural Attitude -

Stratigraphic Assignment Lavender Shale Member, Ft. Payne Chert (Mississippian).

Sample Description & Comments No further data available.

Compiled by B. J. O'Connor Date 5-1-84

CERAMIC TESTS AND ANALYSES

Material Shale (Conasauga). Compilation Map Location No. F1.64-10

County Floyd. Sample Number 56.

Raw Properties: Lab & No. USBM, Norris, Tenn.; No. 1555-A.

Date Reported 5-28-64 (revised 1967) Ceramist M. V. Denny, USBM (revised by M. E. Tyrrell, Tuscaloosa, Ala.)

Water of Plasticity 27.9% Working Properties Short (Moderate plasticity.) working, smooth, plastic. pH = 6.71 (Not effervescent with HCl.)

Color Buff. Drying Shrinkage 5.0 % Dry Strength Good. (Fair.)

Remarks Drying Characteristics: Good. (No defects.)

Slow Firing Tests:

Temp. °F (°C)	Color	Hardness (Mohs')	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data: Bulk Dens. gm/cc
1800 (982)	Tan	Fair hard (3)	5.0	24.2	40.4	1.67
1900 (1038)	Tan	Hard (4)	6.0	17.5	32.2	1.84
2000 (1093)	Light brown	Very hard (5)	10.0	10.6	21.7	2.05
2100 (1149)	Brown	Very hard (5)	15.0	8.2	17.5	2.14
2200 (1204)	Red-brown	Steel hard (6)	15.0	4.7	10.3	2.20
2300 (1260)	Dark brown	Steel hard (6)	15.0	2.1	4.8	2.27

Remarks / Other Tests (Should fire to "SW" face brick specifications at about 2100°F, 1149°C). High firing shrinkage. Good color. Potential Use: (Face brick; sewer pipe.) Good tile or brick if quartz added to reduce shrinkage.

Preliminary Bloating (Quick Firing) Tests: Negative.

Note: Appr. Por. and Bulk Dens. plus data and remarks in parentheses are from 1967 revised data sheets by Tyrrell.

Crushing Characteristics (unfired material) -

Particle Size -20 mesh. Retention Time 15 min. draw trials (following 3-4 hr. to 1800°F, 982°C).

Chemical & Mineralogical Data: Not determined.

Chemical Analysis		Mineralogy	
Oxide	Weight %	Mineral	volume %
SiO_2			
TiO_2		Quartz	
Al_2O_3		Feldspar	
Fe_2O_3		Carbonate	
FeO		Mica	
MnO		Chlorite-vermiculite	
MgO		Montmorillonite	
CaO		Others	
Na_2O			
K_2O			
P_2O_5			
S (total)		Total	
C (org.)			
CO_2			
H_2O^-			
H_2O^+			
Ignition loss			
Total			

Analyst _____ _____

Date _____ _____

Method _____ _____

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. -. Lat. _____, Long. _____.

Field No. 56., Collected by J.W. Smith ? Date c. 1963.

Sample Method Grab (?). Weathering/alteration -

Structural Attitude -

Stratigraphic Assignment Conasauga Group (Cambrian).

Sample Description & Comments No further data available.

Compiled by B. J. O'Connor Date 5-1-84

CERAMIC TESTS AND ANALYSES

Material Shale (Conasauga). Compilation Map Location No. F1.64-11

County Floyd. Sample Number 57.

Raw Properties: Lab & No. USBM, Norris, Tenn.; No. 1555-B.

Date Reported 5-28-64 (revised 1967) Ceramist M. V. Denny, USBM (revised by M. E. Tyrrell, Tuscaloosa, Ala.)

Water of Plasticity 22.2% Working Properties (Low plasticity.) Short working, smooth, plastic. pH = 6.0. (Not effervescent with HCl.)

Color Gray-brown. Drying Shrinkage 5.0% Dry Strength Good. (Low.)

Remarks Drying Characteristics: Good. (No defects.)

Slow Firing Tests:

Temp. °F (°C)	Color	Hardness (Mohs')	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data: Bulk Dens. gm/cc
1800 (982)	Tan	Fair hard (3)	5.5(5.0)	16.5	29.9	1.81
1900 (1038)	Tan	Fair hard (3)	5.5(5.0)	16.2	30.0	1.85
2000 (1093)	Light brown	Hard (4)	9.5(9.0)	11.8	23.6	2.00
2100 (1149)	Brown	Hard (4)	9.5(9.0)	10.5	21.5	2.05
2200 (1204)	Choco-late	Very hard (5)	9.5(9.0)	7.4	15.6	2.11
2300 (1260)	Black-brown	Steel hard (6)	12.5	3.2	7.0	2.20

Remarks / Other Tests (Should fire to "SW" face brick specifications about 2150°F, 1177°C). Good color, shrinkage slightly high. Potential Use: (Face brick; sewer pipe.) Tile and brick.

Preliminary Bloating (Quick Firing) Tests: Negative.

Note: Appr. Por. and Bulk Dens. plus data and remarks in parentheses are from 1967 revised data sheets by Tyrrell.

Crushing Characteristics (unfired material) -

Particle Size -20 mesh. Retention Time 15 min. draw trials (following 3-4 hr. to 1800°F, 982°C).

Chemical & Mineralogical Data: Not determined.

Chemical Analysis		Mineralogy	
Oxide	Weight %	Mineral	volume %
SiO_2			
TiO_2		Quartz	
Al_2O_3		Feldspar	
Fe_2O_3		Carbonate	
FeO		Mica	
MnO		Chlorite-vermiculite	
MgO		Montmorillonite	
CaO		Others	
Na_2O			
K_2O			
P_2O_5			
S (total)		Total	
C (org.)			
CO_2			
H_2O^-			
H_2O^+			
Ignition loss			
Total			

Analyst _____ _____

Date _____ _____

Method _____ _____

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. -. Lat. _____, Long. _____.

Field No. 57., Collected by J.W. Smith ? Date c. 1963.

Sample Method Grab (?). Weathering/alteration -

Structural Attitude -

Stratigraphic Assignment Conasauga Group (Cambrian).

Sample Description & Comments No further data available.

Compiled by B. J. O'Connor Date 5-1-84

CERAMIC TESTS AND ANALYSES

Material Shale (Conasauga). Compilation Map Location No. Fl.64-12

County Floyd. Sample Number 58.

Raw Properties: Lab & No. USBM, Norris, Tenn.; No. 1555-C

Date Reported 5-28-64 (revised 1967) Ceramist M. V. Denny, USBM (revised by M. E. Tyrrell, Tuscaloosa, Ala.)

Water of Plasticity 27.4 % Working Properties (Moderate plasticity.) Short working, smooth, plastic. pH = 6.10 (Not effervescent with HCl.)

Color Red. Drying Shrinkage 5.0 % Dry Strength (Fair.) Good.

Remarks Drying Characteristics: Good. (No defects.)

Slow Firing Tests:

Temp. °F (°C)	Color	Hardness (Mohs')	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data: Bulk Dens. gm/cc
1800 (982)	Tan	Fair hard (3)	5.0	22.7	38.1	1.68
1900 (1038)	Tan	Hard (4)	7.5	18.0	32.8	1.82
2000 (1093)	Medium brown (Brown)	Very hard (5)	10.0	11.6	23.4	2.02
2100 (1149)	Brown	Very hard (5)	12.5	9.5	19.9	2.09
2200 (1204)	Chocolate	Steel hard (6)	12.5	6.2	13.5	2.17
2300 (1260)	Black-brown (Dark brown)	Steel hard (6)	12.5	3.2	7.2	2.26

Remarks / Other Tests (Should fire to "SW" face brick specifications at about 2150°F, 1177°C.) High firing shrinkage. Good color. Potential Use: (Face brick; sewer pipe.) Brick and tile if quartz added to lower shrinkage.

Preliminary Bloating (Quick Firing) Tests: Negative.

Note: Appr.Por. and Bulk Dens. plus data and remarks in parentheses are from 1967 revised data sheets by Tyrrell.

locn. no. Fl.64-12 , cont.

Crushing Characteristics (unfired material) -

Particle Size -20 mesh. Retention Time 15 min. draw trials (following 3-4 hr. to 1800°F, 982°C).

Chemical & Mineralogical Data: Not determined.

Chemical Analysis		Mineralogy	
Oxide	Weight %	Mineral	volume %
SiO_2			
TiO_2		Quartz	
Al_2O_3		Feldspar	
Fe_2O_3		Carbonate	
FeO		Mica	
MnO		Chlorite-vermiculite	
MgO		Montmorillonite	
CaO		Others	
Na_2O			
K_2O			
P_2O_5			
S (total)		Total	
C (org.)			
CO_2			
H_2O^-			
H_2O^+			
Ignition loss			
Total			

Analyst _____ _____

Date _____ _____

Method _____ _____

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. -. Lat. _____, Long. _____.

Field No. 58., Collected by J.W. Smith ? Date c. 1963.

Sample Method Grab (?). Weathering/alteration -

Structural Attitude -

Stratigraphic Assignment Conasauga Group (Cambrian).

Sample Description & Comments No further data available.

Compiled by B. J. O'Connor Date 5-1-84

CERAMIC TESTS AND ANALYSES

Material Shale (Conasauga). Compilation Map Location No. F1.64-13

County Floyd. Sample Number 59.

Raw Properties: Lab & No. USBM, Norris, Tenn.; No. 1555-D.

Date Reported 5-28-64 (revised 1967) Ceramist M. V. Denny, USBM (revised by M. E. Tyrrell, Tuscaloosa, Ala.)

Water of Plasticity 24.4 % Working Properties (Moderate plasticity.) Short working, smooth, plastic. pH = 8.02 (Slight effervescence with HCl.)

Color Gray. Drying Shrinkage 5.0 % Dry Strength Good. (Fair.)

Remarks Drying Characteristics: Fair; slight warping and cracking. (No defects.)

Slow Firing Tests:

Temp. °F (°C)	Color	Hardness (Mohs')	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data: Bulk Dens. gm/cc
1800 (982)	Tan	Fair hard (3)	9.0	12.9	24.4	1.89
1900 (1038)	Light brown	Hard (4)	9.5(9.0)	9.1	18.4	2.02
2000 (1093)	Brown	Very hard (5)	10.5(10.0)	4.5	9.8	2.17
2100 (1149)	Brown	Very hard (5)	10.5(10.0)	3.3	7.2	2.18
2200 (1204)	Dark brown	Steel hard (6)	10.5(10.0)	1.5	3.3	2.22
2300 (1260)	Brownish-black	Steel hard	10.0 (Expanded)	1.2	-	-

Remarks / Other Tests (Probably limy.) Fair color; high shrinkage, some surface cracks. Potential Use: None. (Not suitable for use in vitreous clay products.)

Preliminary Bloating (Quick Firing) Tests: Negative.

Note: Appr.Por. and Bulk Dens. plus data and remarks in parentheses are from 1967 revised data sheets by Tyrrell.

Crushing Characteristics (unfired material) -

Particle Size -20 mesh. Retention Time 15 min. draw trials (following 3-4 hr. to 1800°F, 982°C).

Chemical & Mineralogical Data: Not determined.

Chemical Analysis		Mineralogy	
Oxide	Weight %	Mineral	volume %
SiO_2			
TiO_2		Quartz	
Al_2O_3		Feldspar	
Fe_2O_3		Carbonate	
FeO		Mica	
MnO		Chlorite-vermiculite	
MgO		Montmorillonite	
CaO		Others	
Na_2O			
K_2O			
P_2O_5			
S (total)		Total	
C (org.)			
CO_2			
H_2O^-			
H_2O^+			
Ignition loss			
Total			

Analyst _____ _____

Date _____ _____

Method _____ _____

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. - . Lat. _____, Long. _____.

Field No. 59. , Collected by J.W. Smith ? Date c. 1963.

Sample Method Grab (?). Weathering/alteration -

Structural Attitude -

Stratigraphic Assignment Conasauga Group (Cambrian).

Sample Description & Comments No further data available.

Compiled by B. J. O'Connor Date 5-1-84

CERAMIC TESTS AND ANALYSES

Material Shale (Conasauga). Compilation Map Location No. F1.64-14

County Floyd. Sample Number 60.

Raw Properties: Lab & No. USBM, Norris, Tenn.; No. 1555-E.

Date Reported 5-28-64 (revised 1967) Ceramist M. V. Denny, USBM (revised by M. E. Tyrrell, Tuscaloosa, Ala.)

Water of Plasticity 27.8% Working Properties (Moderate plasticity.) Short working, smooth, plastic. pH = 6.19 (Not effervescent with HCl.)

Color Red-gray. Drying Shrinkage 7.5(5.0)% Dry Strength Fair.

Remarks Drying characteristics: Good. (No defects.)

Slow Firing Tests:

Temp. °F (°C)	Color	Hardness (Mohs')	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data: Bulk Dens. gm/cc
1800 (982)	Tan	Fair hard (3)	5.5(5.0)	17.6	31.7	1.80
1900 (1038)	Tan	Hard (4)	10.0	14.6	27.4	1.88
2000 (1093)	Light brown	Very hard (5)	12.5	8.2	17.5	2.13
2100 (1149)	Brown	Very hard (5)	15.0	5.7	12.7	2.22
2200 (1204)	Choco-late	Steel hard (6)	14.5(15.0)	2.8	6.4	2.30
2300 (1260)	Black-brown	Steel hard (6)	14.5(15.0)	1.9	4.4	2.30

Remarks / Other Tests (Should fire to "SW" face brick specifications at about 2000°F, 1093°C). High firing shrinkage. Good color. Potential Use: (Face brick; sewer pipe.) Brick and tile if shrinkage lowered.

Preliminary Bloating (Quick Firing) Tests: Negative.

Note: Appr.Por. and Bulk Dens. plus data and remarks in parentheses are from 1967 revised data sheets by Tyrrell.

locn. no. Fl.64-14 , cont.

Crushing Characteristics (unfired material) -

Particle Size -20 mesh. Retention Time 15 min. draw trials (following 3-4 hr. to 1800°F, 982°C).

Chemical & Mineralogical Data: Not determined.

Chemical Analysis		Mineralogy	
Oxide	Weight %	Mineral	volume %
SiO_2			
TiO_2		Quartz	
Al_2O_3		Feldspar	
Fe_2O_3		Carbonate	
FeO		Mica	
MnO		Chlorite-vermiculite	
MgO		Montmorillonite	
CaO		Others	
Na_2O			
K_2O			
P_2O_5			
S (total)		Total	
C (org.)			
CO_2			
H_2O^-			
H_2O^+			
Ignition loss			
Total			

Analyst _____ _____

Date _____ _____

Method _____ _____

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. -. Lat. _____, Long. _____.

Field No. 60., Collected by J.W. Smith ? Date c. 1963.

Sample Method Grab (?). Weathering/alteration -

Structural Attitude -

Stratigraphic Assignment Conasauga Group (Cambrian).

Sample Description & Comments No further data available.

Compiled by B. J. O'Connor Date 5-1-84

CERAMIC TESTS AND ANALYSES

Material Shale (Conasauga). Compilation Map Location No. F1.64-15

County Floyd. Sample Number 61.

Raw Properties: Lab & No. USBM, Norris, Tenn.; No. 1555-F.

Date Reported 5-28-64 (revised 1967) Ceramist M. V. Denny, USBM (revised by M. E. Tyrrell, Tuscaloosa, Ala.)

Water of Plasticity 23.4 % Working Properties (Moderate plasticity.) Long working, plastic, smooth, fatty. pH = 8.72 (Slight effervescence with HCl.)

Color Gray-brown. Drying Shrinkage 7.5 % Dry Strength Good. (Fair.)

Remarks Drying Characteristics: Good, slightly uneven. (No defects.)

Slow Firing Tests:

Temp. °F (°C)	Color	Hardness (Mohs')	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data: Bulk Dens.
1800 (982)	Tan	Fair hard (3)	10.0	8.1	16.4	2.03
1900 (1038)	Tan	Hard (4)	10.0	4.4	4.4	2.17
2000 (1093)	Brown	Very hard (5)	15.0	1.0	1.0	2.33
2100 (1149)	Chocolate	Very hard	15.0 (Expanded)	0.4	-	-
2200 (1204)	Dark brown	Steel hard	11.0	0.2	-	-
2300 (1260)	Gray-black	Steel hard	10.0	0.7	-	-

Remarks / Other Tests (Limy.) Contains approx. 2% $CaCO_3$. Fair color, slight cracking, high shrinkage.) Potential Use: (Not suitable for use in vitreous clay products.) Possible additive to low shrinkage, high absorption clay.

Preliminary Bloating (Quick Firing) Tests: Positive.

Temp. °F (°C)	Absorption %	Bulk Density g/cm^3	Bulk Density lb/ft^3	Remarks
1900 (1038)	7.9	2.45	153	(No expansion.) Shaly.
2000 (1093)	2.1	1.55	97	(Slight expansion.) Shaly-blisters.
2100 (1149)	0.84	1.41	88	(Slight expansion.) Shaly-blisters.
2200 (1204)	0.90	1.21	76(75.5)	(Slight expansion.) Layering bloating, dark.
2300 (1260)	1.21	1.01	63	(Fair expansion.) Layering bloating, (dark.

Remarks (Marginal material for lightweight aggregate [refractory.]) Test in rotary kiln.

Note: Appr.Por. and Bulk Dens. plus data and remarks in parentheses are from 1967 revised data sheets by Tyrrell.

Crushing Characteristics (unfired material) -

Particle Size -20 mesh. Retention Time 15 min. draw trials (following 3-4 hr. to 1800°F, 982°C).

Chemical & Mineralogical Data: Not determined.

Chemical Analysis		Mineralogy	
Oxide	Weight %	Mineral	volume %
SiO_2			
TiO_2		Quartz	
Al_2O_3		Feldspar	
Fe_2O_3		Carbonate	
FeO		Mica	
MnO		Chlorite-vermiculite	
MgO		Montmorillonite	
CaO		Others	
Na_2O			
K_2O			
P_2O_5			
S (total)		Total	
C (org.)			
CO_2			
H_2O^-			
H_2O^+			
Ignition loss			
Total			

Analyst _____ _____

Date _____ _____

Method _____ _____

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. -. Lat. _____, Long. _____.

Field No. 61., Collected by J.W. Smith ? Date c. 1963.

Sample Method Grab (?). Weathering/alteration -

Structural Attitude -

Stratigraphic Assignment Conasauga Group (Cambrian).

Sample Description & Comments No further data available.

Compiled by B. J. O'Connor Date 5-1-84

CERAMIC TESTS AND ANALYSES

Material Shale (Conasauga). Compilation Map Location No. F1.64-16

County Floyd. Sample Number 62.

Raw Properties: Lab & No. USBM, Norris, Tenn.; No. 1555-G.

Date Reported 5-28-64 (revised 1967) Ceramist M. V. Denny, USBM (revised by M. E. Tyrrell, Tuscaloosa, Ala.)

Water of Plasticity 27.8 % Working Properties (Moderate plasticity.) Long working, plastic, smooth, fatty. pH = 5.83 (Not effervescent with HCl.)

Color Light red. Drying Shrinkage 5.0 % Dry Strength (Fair.)

Remarks Drying Characteristics: Good; slight surface crazing and scum. (No defects.)

Slow Firing Tests:

Temp. °F (°C)	Color	Hardness (Mohs')	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data: Bulk Dens. gm/cc
1800 (982)	Tan	Soft (2)	5.0	22.1	36.9	1.67
1900 (1038)	Tan	Fair hard (3)	7.5	19.3	33.6	1.74
2000 (1093)	Light brown	Hard (4)	10.0	14.3	27.3	1.91
2100 (1149)	Brown	Hard (4)	12.5	12.0	23.5	1.96
2200 (1204)	Choco-late	Very hard (5)	12.5	8.2	17.1	2.09
2300 (1260)	Brown-black (Dark brown)	Steel hard (6)	12.5	4.2	9.2	2.20

Remarks / Other Tests (Should fire to "MW" face brick specifications at about 2100°F, 1149°C). Fair color, high shrinkage, fairly high absorption. Potential Use: None. (Face brick; sewer pipe.)

Preliminary Bloating (Quick Firing) Tests: Negative.

Note: Appr.Por. and Bulk Dens. plus data and remarks in parentheses are from 1967 revised data sheets by Tyrrell.

Crushing Characteristics (unfired material) -

Particle Size -20 mesh. Retention Time 15 min. draw trials (following 3-4 hr. to 1800°F, 982°C).

Chemical & Mineralogical Data: Not determined.

Chemical Analysis		Mineralogy	
Oxide	Weight %	Mineral	volume %
SiO_2			
TiO_2		Quartz	
Al_2O_3		Feldspar	
Fe_2O_3		Carbonate	
FeO		Mica	
MnO		Chlorite-vermiculite	
MgO		Montmorillonite	
CaO		Others	
Na_2O			
K_2O			
P_2O_5			
S (total)		Total	
C (org.)			
CO_2			
H_2O^-			
H_2O^+			
Ignition loss			
Total			

Analyst _____ _____

Date _____ _____

Method _____ _____

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. -. Lat. _____, Long. _____.

Field No. 62., Collected by J.W. Smith ? Date c. 1963.

Sample Method Grab (?). Weathering/alteration -

Structural Attitude -

Stratigraphic Assignment Conasauga Group (Cambrian).

Sample Description & Comments No further data available.

Compiled by B. J. O'Connor Date 5-1-84

CERAMIC TESTS AND ANALYSES

Material Shale (Floyd). Compilation Map Location No. F1.64-17

County Floyd. Sample Number 70.

Raw Properties: Lab & No. USBM, Norris, Tenn.; No. 1555-O.

Date Reported 5-28-64 (revised 1967) Ceramist M. V. Denny, USBM (revised by M. E. Tyrrell, Tuscaloosa, Ala.)

Water of Plasticity 26.0 % Working Properties (Moderate plasticity.) Long working, plastic, smooth. pH = 5.35 (Not effervescent with HCl.)

Color Yellow. Drying Shrinkage 10.0 (5.0)% Dry Strength (Fair.) Good.

Remarks Drying Characteristics: Fair - small cracks. (No defects.)

Slow Firing Tests:

Temp. °F (°C)	Color	Hardness (Mohs')	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data: Bulk Dens. gm/cc
1800 (982)	Tan	Fair hard (3)	5.5(5.0)	23.8	39.3	1.65
1900 (1038)	Tan	Hard (4)	10.0	18.6	33.3	1.79
2000 (1093)	Light brown	Hard (4)	10.0	15.8	29.7	1.88
2100 (1149)	Brown	Very hard (5)	11.3(11.0)	12.5	24.6	1.97
2200 (1204)	Dark brown	Steel hard (5)	12.5	7.9	16.7	2.11
2300 (1260)	Dark brown	Steel hard	12.5 (Expanded)	8.3	-	-

Remarks / Other Tests (Should fire to "MW" face brick specifications at about 2100°F, 1149°C). Fair color; shrinkage and absorption high. Some sulfate, crazed surface. Potential Use: (Face brick.) None.

Preliminary Bloating (Quick Firing) Tests: Negative.

Note: App.Por. and Bulk Dens. plus data and remarks in parentheses are from 1967 revised data sheets by Tyrrell.

Crushing Characteristics (unfired material) -

Particle Size -20 mesh. Retention Time 15. min. draw trials (following 3-4 hr. to 1800°F, 982°C).

Chemical & Mineralogical Data: Not determined.

Chemical Analysis		Mineralogy	
Oxide	Weight %	Mineral	volume %
SiO_2			
TiO_2		Quartz	
Al_2O_3		Feldspar	
Fe_2O_3		Carbonate	
FeO		Mica	
MnO		Chlorite-vermiculite	
MgO		Montmorillonite	
CaO		Others	
Na_2O			
K_2O			
P_2O_5			
S (total)		Total	
C (org.)			
CO_2			
H_2O^-			
H_2O^+			
Ignition loss			
Total			

Analyst _____ _____

Date _____ _____

Method _____ _____

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. - . Lat. _____, Long. _____.

Field No. 70. , Collected by J.W. Smith ? Date c. 1963.

Sample Method Grab (?). Weathering/alteration -

Structural Attitude -

Stratigraphic Assignment Floyd Shale (Mississippian).

Sample Description & Comments No further data available.

Compiled by B. J. O'Connor Date 5-1-84

CERAMIC TESTS AND ANALYSES

Material Shale (Floyd) Compilation Map Location No. F1.64-18

County Floyd. Sample Number 71.

Raw Properties: Lab & No. USBM, Norris, Tenn.; No. 1555-P.

Date Reported 5-28-64 (revised 1967) Ceramist M. V. Denny, USBM (revised by M. E. Tyrrell, Tuscaloosa, Ala.)

Water of Plasticity 31.4% Working Properties (Moderate plasticity.) Long working, plastic, smooth, gritty. pH = 5.28 (Not effervescent with HCl.)

Color Orange. Drying Shrinkage 10.0(5.0)% Dry Strength Good. (Fair.)

Remarks Drying Characteristics: Good. (No defects.)

Slow Firing Tests:

Temp. °F (°C)	Color	Hardness (Mohs')	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data: Bulk Dens. gm/cc
1800 (982)	Tan	Soft (2)	5.0	25.4	41.1	1.62
1900 (1038)	Tan	Fair hard (3)	7.5	22.7	38.6	1.70
2000 (1093)	Light brown	Hard (4)	10.0	19.9	35.2	1.77
2100 (1149)	Brown	Hard (4)	10.0	16.6	31.0	1.87
2200 (1204)	Brown	Very hard (5)	12.5	12.6	25.1	1.99
2300 (1260)	Brown	Very hard (5)	12.0(12.5)	12.4	24.7	1.99

Remarks / Other Tests (Should fire to "MW" face brick specifications at about 2200°F, 1204°C). Color good; shrinkage and absorption high. Potential Use: (Face brick.) Addition of fine quartz would give a good brick or tile for inside use.

Preliminary Bloating (Quick Firing) Tests: Negative.

Note: Appr.Por. and Bulk Dens. plus data and remarks in parentheses are from 1967 revised data sheets by Tyrrell.

Crushing Characteristics (unfired material) -

Particle Size -20 mesh. Retention Time 15 min. draw trials (following 3-4 hr. to 1800°F, 982°C).

Chemical & Mineralogical Data: Not determined.

Chemical Analysis		Mineralogy	
Oxide	Weight %	Mineral	volume %
SiO_2			
TiO_2		Quartz	
Al_2O_3		Feldspar	
Fe_2O_3		Carbonate	
FeO		Mica	
MnO		Chlorite-vermiculite	
MgO		Montmorillonite	
CaO		Others	
Na_2O			
K_2O			
P_2O_5			
S (total)		Total	
C (org.)			
CO_2			
H_2O^-			
H_2O^+			
Ignition loss			
Total			

Analyst _____ _____

Date _____ _____

Method _____ _____

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. -. Lat. _____, Long. _____.

Field No. 71., Collected by J.W. Smith ? Date c. 1963.

Sample Method Grab (?). Weathering/alteration -

Structural Attitude -

Stratigraphic Assignment Floyd Shale (Mississippian).

Sample Description & Comments No further data available.

Compiled by B. J. O'Connor Date 5-1-84

CERAMIC TESTS AND ANALYSES

Material Shale (Conasauga). Compilation Map Location No. Fl.64-19

County Floyd. Sample Number 72.

Raw Properties: Lab & No. USBM, Norris, Tenn.; No. 1555-Q.

Date Reported 5-28-64 (revised 1967) Ceramist M. V. Denny, USBM (revised by M. E. Tyrrell, Tuscaloosa, Ala.)

Water of Plasticity 15.8% Working Properties (Low plasticity.) Short working, mealy, smooth. pH = 7.85 (Slight effervescence with HCl.)

Color Buff. Drying Shrinkage 2.5 % Dry Strength Good. (Low.)

Remarks Drying Characteristics: Fair - crazing. (No defects.)

Slow Firing Tests:

Temp. °F (°C)	Color	Hardness (Mohs')	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data: Bulk Dens. gm/cc
1800 (982)	Tan	Fair hard (3)	5.0	14.4	27.1	1.88
1900 (1038)	Brown	Hard (4)	5.5(5.0)	9.8	20.2	2.06
2000 (1093)	Light brown	Hard (4)	6.0	9.9	20.4	2.06
2100 (1149)	Brown	Very hard (5)	6.0	7.5	16.0	2.13
2200 (1204)	Dark brown	Steel hard (6)	10.0	4.8	10.8	2.24
2300 (1260)	Dark brown	Steel hard (6)	10.7(10.0)	4.3	9.6	2.24

Remarks / Other Tests (Should fire to "SW" face brick specifications at about 2050°F, 1121°C. Might be limy.) Fair color, spotted surface. Potential Use: (Face brick.) Brick and tile if color not objectionable.

Preliminary Bloating (Quick Firing) Tests: Negative.

Note: Appr.Por. and Bulk Dens. plus data and remarks in parentheses are from 1967 revised data sheets by Tyrrell.

Crushing Characteristics (unfired material) -

Particle Size -20 mesh. Retention Time 15 min. draw trials (following 3-4 hr. to 1800°F, 982°C).

Chemical & Mineralogical Data: Not determined.

Chemical Analysis		Mineralogy	
Oxide	Weight %	Mineral	volume %
SiO_2			
TiO_2		Quartz	
Al_2O_3		Feldspar	
Fe_2O_3		Carbonate	
FeO		Mica	
MnO		Chlorite-vermiculite	
MgO		Montmorillonite	
CaO		Others	
Na_2O			
K_2O			
P_2O_5			
S (total)		Total	
C (org.)			
CO_2			
H_2O^-			
H_2O^+			
Ignition loss			
Total			

Analyst _____ _____

Date _____ _____

Method _____ _____

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. -. Lat. _____, Long. _____.

Field No. 72., Collected by J.W. Smith ? Date c. 1963.

Sample Method Grab (?). Weathering/alteration -

Structural Attitude -

Stratigraphic Assignment Conasauga Group (Cambrian).

Sample Description & Comments No further data available.

Compiled by B. J. O'Connor Date 5-1-84

CERAMIC TESTS AND ANALYSES

Material Shale (Floyd). Compilation Map Location No. F1.64-20

County Floyd. Sample Number 73.

Raw Properties: Lab & No. USBM, Norris, Tenn.; No. 1555-R.

Date Reported 5-28-64 (revised 1967) Ceramist M. V. Denny, USBM (revised by M. E. Tyrrell, Tuscaloosa, Ala.)

Water of Plasticity 24.6% Working Properties (Moderate plasticity) Long working, plastic, smooth, fatty, gritty. pH = 5.50 (Not effervescent with HCl.)

Color Buff. Drying Shrinkage 5.5(5.0)% Dry Strength (Fair.)

Remarks Drying Characteristics: Good - slight warping. (No defects.)

Slow Firing Tests:

Temp. °F (°C)	Color	Hardness (Mohs')	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data: Bulk Dens. gm/cc
1800 (982)	Light brown	Fair hard (3)	6.0	13.5	27.4	2.03
1900 (1038)	Light brown	Hard (4)	10.0	11.5	24.0	2.09
2000 (1093)	Light brown	Hard (4)	10.0	11.0	23.3	2.12
2100 (1149)	Brown	Very hard (5)	15.0	6.9	15.7	2.27
2200 (1204)	Choco-late	Steel hard (6)	15.0	3.7	8.9	2.41
2300 (1260)	Dark brown	Steel hard (6)	15.0	2.9	7.0	2.41

Remarks / Other Tests (Should fire to "SW" face brick specifications at about 2050°F, 1121°C). High firing shrinkage. Slight cracking, fair color, mottled surface. Potential Use: None. (Face brick; sewer pipe.)

Preliminary Bloating (Quick Firing) Tests: Negative.

Note: Appr.Por. and Bulk Dens. plus data and remarks in parentheses are from 1967 revised data sheets by Tyrrell.

Crushing Characteristics (unfired material) -

Particle Size -20 mesh. Retention Time 15 min. draw trials (following 3-4 hr. to 1800°F, 982°C).

Chemical & Mineralogical Data: Not determined.

Chemical Analysis		Mineralogy	
Oxide	Weight %	Mineral	volume %
SiO_2			
TiO_2		Quartz	
Al_2O_3		Feldspar	
Fe_2O_3		Carbonate	
FeO		Mica	
MnO		Chlorite-vermiculite	
MgO		Montmorillonite	
CaO		Others	
Na_2O			
K_2O			
P_2O_5			
S (total)		Total	
C (org.)			
CO_2			
H_2O^-			
H_2O^+			
Ignition loss			
Total			

Analyst _____ _____

Date _____ _____

Method _____ _____

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. -. Lat. _____, Long. _____.

Field No. 73., Collected by J.W. Smith ? Date c. 1963.

Sample Method Grab (?). Weathering/alteration -

Structural Attitude -

Stratigraphic Assignment Floyd Shale (Mississippian).

Sample Description & Comments No further data available.

Compiled by B. J. O'Connor Date 5-1-84

CERAMIC TESTS AND ANALYSES

Material Shale (Floyd). Compilation Map Location No. F1.64-21

County Floyd. Sample Number 74.

Raw Properties: Lab & No. USBM, Norris, Tenn.; No. 1555-S.

Date Reported 5-28-64 (revised 1967) Ceramist M. V. Denny, USBM (revised by M.E. Tyrrell, Tuscaloosa, Ala.)

Water of Plasticity 25.4% Working Properties (Moderate plasticity.) Long working, plastic, smooth, fatty. pH = 5.30 (Not effervescent with HCl.)

Color Buff. Drying Shrinkage 5.0 % Dry Strength Good. (Fair.)

Remarks Drying Characteristics: Good. (No defects.)

Slow Firing Tests:

Temp. °F (°C)	Color	Hardness (Mohs')	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data: Bulk Dens. gm/cc
1800 (982)	Tan	Fair hard (3)	5.0	21.0	36.8	1.75
1900 (1038)	Tan	Hard (4)	5.5(5.0)	19.1	33.4	1.75
2000 (1093)	Tan	Hard (4)	5.5(5.0)	18.5	32.6	1.76
2100 (1149)	Light brown	Very Hard (5)	9.0	15.3	28.5	1.86
2200 (1204)	Brown	Steel hard (6)	10.5(10.0)	9.3	18.9	2.03
2300 (1260)	Brown	Steel hard (6)	10.5(10.0)	6.5	13.8	2.12

Remarks / Other Tests (Should fire to "MW" face brick specifications at about 2150°F, 1177°C). Good color, peppery surface, absorption a little high.
Potential Use: (Face brick.) Decorative brick and tile.

Preliminary Bloating (Quick Firing) Tests: Negative.

Note: Appr.Por. and Bulk Dens. plus data and remarks in parentheses are from 1967 revised data sheets by Tyrrell.

Crushing Characteristics (unfired material) -

Particle Size -20 mesh. Retention Time 15 min. draw trials (following 3-4 hr. to 1800°F, 982°C).

Chemical & Mineralogical Data: Not determined.

Chemical Analysis		Mineralogy	
Oxide	Weight %	Mineral	volume %
SiO_2			
TiO_2		Quartz	
Al_2O_3		Feldspar	
Fe_2O_3		Carbonate	
FeO		Mica	
MnO		Chlorite-vermiculite	
MgO		Montmorillonite	
CaO		Others	
Na_2O			
K_2O			
P_2O_5			
S (total)		Total	
C (org.)			
CO_2			
H_2O^-			
H_2O^+			
Ignition loss			
Total			

Analyst _____ _____

Date _____ _____

Method _____ _____

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. -. Lat. _____, Long. _____.

Field No. 74., Collected by J.W. Smith ? Date c. 1963.

Sample Method Grab (?). Weathering/alteration -

Structural Attitude -

Stratigraphic Assignment Floyd Shale (Mississippian).

Sample Description & Comments No further data available.

Compiled by B. J. O'Connor Date 5-1-84

CERAMIC TESTS AND ANALYSES

Material Shale (Conasauga). Compilation Map Location No. F1.64-22

County Floyd. Sample Number 75.

Raw Properties: Lab & No. USBM, Norris, Tenn.; No. 1555-T.

Date Reported 5-28-64 (revised 1967) Ceramist M. V. Denny, USBM (revised by M. E. Tyrrell, Tuscaloosa, Ala.)

Water of Plasticity 29.0% Working Properties (Moderate plasticity.) Long working, plastic, smooth, fatty. pH = 5.18 (Not effervescent with HCl.)

Color Yelow. Drying Shrinkage 6.0 % Dry Strength (Fair.) Good.

Remarks Drying Characteristics: Good, slight cracking (No defects.)

Slow Firing Tests:

Temp. °F (°C)	Color	Hardness (Mohs')	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data: Bulk Dens. gm/cc
1800 (982)	Tan	Hard (4)	9.5(9.0)	18.9	32.5	1.72
1900 (1038)	Tan	Very hard (5)	10.5(10.0)	13.3	25.5	1.92
2000 (1093)	Tan	Very hard (5)	11.0	12.6	24.6	1.95
2100 (1149)	Light brown	Steel hard (6)	15.0	8.0	17.0	2.12
2200 (1204)	Brown	Steel hard (6)	17.5	3.6	8.2	2.27
2300 (1260)	Choco-late	Steel hard	17.5 (Expanded)	3.0	-	-

Remarks / Other Tests (Should fire to "MW" face brick specifications at about 2000°F, 1093°C). Good color; too high shrinkage. Potential Use: (Face brick.) Decorative or art pottery.

Preliminary Bloating (Quick Firing) Tests: Negative.

Note: Appr.Por. and Bulk Dens. plus data and remarks in parentheses are from 1967 revised data sheets by Tyrrell.

Crushing Characteristics (unfired material) -

Particle Size -20 mesh. Retention Time 15 min. draw trials (following 3-4 hr. to 1800°F, 982°C).

Chemical & Mineralogical Data: Not determined.

Chemical Analysis		Mineralogy	
Oxide	Weight %	Mineral	volume %
SiO_2			
TiO_2		Quartz	
Al_2O_3		Feldspar	
Fe_2O_3		Carbonate	
FeO		Mica	
MnO		Chlorite-vermiculite	
MgO		Montmorillonite	
CaO		Others	
Na_2O			
K_2O			
P_2O_5			
S (total)		Total	
C (org.)			
CO_2			
H_2O^-			
H_2O^+			
Ignition loss			
Total			

Analyst _____ _____

Date _____ _____

Method _____ _____

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. - . Lat. _____, Long. _____.

Field No. 75., Collected by J.W. Smith ? Date c. 1963.

Sample Method Grab (?). Weathering/alteration -

Structural Attitude -

Stratigraphic Assignment Conasauga Group (Cambrian).

Sample Description & Comments No further data available.

Compiled by B. J. O'Connor Date 5-1-84

CERAMIC TESTS AND ANALYSES

Material Shale (Conasauga). Compilation Map Location No. F1.64-23

County Floyd. Sample Number 95.

Raw Properties: Lab & No. USBM, Norris, Tenn.; No. 1556-N.

Date Reported 6-26-64 (revised 1967) Ceramist M. V. Denny, USBM (revised by M. E. Tyrrell, Tuscaloosa, Ala.)

Water of Plasticity 27.0 % Working Properties (Moderate plasticity.) (pH = 5.5. Not effervescent with HCl.)

Color Tan. Drying Shrinkage 6.0 % Dry Strength (Fair.)

Remarks (No drying defects.)

Slow Firing Tests:

Temp. °F (°C)	Color	Hardness (Mohs')	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data: Bulk Dens. gm/cc
1800 (982)	Tan	Fair hard (3)	7.5	16.2	30.3	1.87
1900 (1038)	Tan	Hard (4)	12.5	10.7	21.9	2.05
2000 (1093)	Tan	Hard (4)	15.0	8.0	17.2	2.15
2100 (1149)	Light brown	Very hard (5)	15.0	6.3	14.0	2.22
2200 (1204)	Brown	Steel hard (6)	15.0	1.5	3.6	2.41
2300 (1260)	-	-	(Expanded)	-	-	-

Remarks / Other Tests (Should fire to "SW" face brick specifications at about 2000°F, 1093°C. High firing shrinkage.) Potential Use: (Face brick.)

Preliminary Bloating (Quick Firing) Tests: Negative.

Note: Appr.Por. and Bulk Dens. plus data and remarks in parentheses are from 1967 revised data sheets by Tyrrell.

Crushing Characteristics (unfired material) -

Particle Size -20 mesh. Retention Time 15 min. draw trials (following 3-4 hr. to 1800°F, 982°C).

Chemical & Mineralogical Data: Not determined.

Chemical Analysis		Mineralogy	
Oxide	Weight %	Mineral	volume %
SiO_2			
TiO_2		Quartz	
Al_2O_3		Feldspar	
Fe_2O_3		Carbonate	
FeO		Mica	
MnO		Chlorite-vermiculite	
MgO		Montmorillonite	
CaO		Others	
Na_2O			
K_2O			
P_2O_5			
S (total)		Total	
C (org.)			
CO_2			
H_2O^-			
H_2O^+			
Ignition loss			
Total			

Analyst _____ _____

Date _____ _____

Method _____ _____

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. -. Lat. _____, Long. _____.

Field No. 95., Collected by J.W.Smith ? Date c. 1963.

Sample Method Grab (?). Weathering/alteration -

Structural Attitude -

Stratigraphic Assignment Conasauga Group (Cambrian).

Sample Description & Comments No further data available.

Compiled by B. J. O'Connor Date 5-1-84

CERAMIC TESTS AND ANALYSES

Material Clay/shale? Compilation Map Location No. F1.67-1

County Floyd. Sample Number 136.

Raw Properties: Lab & No. USBM, Tuscaloosa, Ala.; No. G-9-1.

Date Reported 1-11-67 Ceramist M. E. Tyrrell, USBM.

Water of Plasticity 23.9 % Working Properties Low plasticity.
pH =5.4. Not effervescent with HCl.

Color Orange. Drying Shrinkage 2.5 % Dry Strength Low.

Remarks No drying defects.

Slow Firing Tests:

Temp. °F (°C)	Color	Hardness (Mohs')	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data: Bulk Dens. gm/cc
1800 (982)	Tan	2	2.5	24.1	37.8	1.57
1900 (1038)	Light brown	3	2.5	17.7	30.6	1.74
2000 (1093)	Light brown	4	2.5	16.1	29.0	1.80
2100 (1149)	Red-brown	5	7.5	12.1	23.4	1.93
2200 (1204)	Dark brown	6	7.5	9.8	19.7	2.01
2300 (1260)	Black	7	10.0	4.3	9.2	2.15

Remarks / Other Tests Should fire to "MW" face brick specifications at about 2100°F (1149°C). Good color. Potential Use: Building brick.

Preliminary Bloating (Quick Firing) Tests: Negative.

Crushing Characteristics (unfired material) -

Particle Size -20 mesh. Retention Time 15 min. draw trials (following 3-4 hr. to 1800°F, 982°C).

Chemical & Mineralogical Data: Not determined.

Chemical Analysis		Mineralogy	
Oxide	Weight %	Mineral	volume %
SiO_2			
TiO_2		Quartz	
Al_2O_3		Feldspar	
Fe_2O_3		Carbonate	
FeO		Mica	
MnO		Chlorite-vermiculite	
MgO		Montmorillonite	
CaO		Others	
Na_2O			
K_2O			
P_2O_5			
S (total)		Total	
C (org.)			
CO_2			
H_2O^-			
H_2O^+			
Ignition loss			
Total			

Analyst _____ _____

Date _____ _____

Method _____ _____

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. -. Lat. _____, Long. _____.

Field No. 136., Collected by J.W. Smith ? Date c. 1966.

Sample Method Grab (?). Weathering/alteration -

Structural Attitude -

Stratigraphic Assignment -

Sample Description & Comments No further data available.

Compiled by B. J. O'Connor Date 5-1-84

CERAMIC TESTS AND ANALYSES

Material Clay/shale? Compilation Map Location No. F1.67-2

County Floyd. Sample Number 137.

Raw Properties: Lab & No. USBM, Tuscaloosa, Ala. No. G-9-2.

Date Reported 1-11-67. Ceramist M. E. Tyrrell, USBM.

Water of Plasticity 34.7 % Working Properties Moderate plasticity. pH = 5.0. Not effervescent with HCl.

Color Yellow. Drying Shrinkage 5.0 % Dry Strength Fair.

Remarks No drying defects.

Slow Firing Tests:

Temp. °F (°C)	Color	Hardness (Mohs')	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data: Bulk Dens. gm/cc
1800 (982)	Tan	2	5.0	32.4	46.0	1.42
1900 (1038)	Light brown	3	10.0	22.7	37.0	1.63
2000 (1093)	Light brown	4	12.5	19.7	33.5	1.70
2100 (1149)	Red-brown	5	12.5	15.5	27.9	1.80
2200 (1204)	Dark brown	6	12.5	12.5	23.5	1.88
2300 (1260)	Black	7	17.5	4.3	9.1	2.12

Remarks / Other Tests Should fire to "MW" face brick specifications at about 2200°F (1204°C). Fair color. Potential Use: Building brick.

Preliminary Bloating (Quick Firing) Tests: Negative.

Crushing Characteristics (unfired material) -

Particle Size -20 mesh. Retention Time 15 min. draw trials (following 3-4 hr. to 1800°F, 982°C).

Chemical & Mineralogical Data: Not determined.

Chemical Analysis		Mineralogy	
Oxide	Weight %	Mineral	volume %
SiO_2			
TiO_2		Quartz	
Al_2O_3		Feldspar	
Fe_2O_3		Carbonate	
FeO		Mica	
MnO		Chlorite-vermiculite	
MgO		Montmorillonite	
CaO		Others	
Na_2O			
K_2O			
P_2O_5			
S (total)		Total	
C (org.)			
CO_2			
H_2O^-			
H_2O^+			
Ignition loss			
Total			

Analyst _____ _____

Date _____ _____

Method _____ _____

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. -. Lat. _____, Long. _____.

Field No. 137., Collected by J.W. Smith ? Date c. 1966.

Sample Method Grab (?). Weathering/alteration -

Structural Attitude -

Stratigraphic Assignment -

Sample Description & Comments No further data available.

Compiled by B. J. O'Connor Date 5-1-84

CERAMIC TESTS AND ANALYSES

Material Clay/shale? Compilation Map Location No. F1.67-3

County Floyd. Sample Number 139.

Raw Properties: Lab & No. USBM, Tuscaloosa, Ala.; No. G-9-3.

Date Reported 1-11-67. Ceramist M. E. Tyrrell, USBM.

Water of Plasticity 21.4 % Working Properties Low plasticity.
pH = 4.3. Not effervescent with HCl.

Color Red. Drying Shrinkage 2.5 % Dry Strength Low.

Remarks No drying defects.

Slow Firing Tests:

Temp. °F (°C)	Color	Hardness (Mohs')	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data: Bulk Dens. gm/cc
1800 (982)	Salmon	2	5.0	19.2	33.0	1.72
1900 (1038)	Light brown	3	7.5	14.2	26.6	1.87
2000 (1093)	Light brown	4	10.0	12.7	24.4	1.92
2100 (1149)	Red-brown	5	10.0	11.0	21.8	1.98
2200 (1204)	Dark brown	6	10.0	9.4	19.0	2.02
2300 (1260)	Black	7	10.0	4.3	9.3	2.17

Remarks / Other Tests Should fire to "MW" face brick specifications as about 2100°F (1149°C). Fair color. Potential Use: Building brick. (Also face brick and quarry tile - see Extrusion Test data.)

Preliminary Bloating (Quick Firing) Tests: Negative.

TUSCALOOSA METALLURGY RESEARCH LABORATORY

Clay Evaluation: Extrusion Tests

Sender's identification: 139 (Floyd Co.)

Date 9/18/67 (+Firing Tests 1-12-67)

Tuscaloosa number: G-9-3

Body composition:
Raw clay through 6 mesh: 100 %.

Tempering water: 21.0 % of dry batch weight.

Vacuum on machine: 27 inches of mercury.

Drying: 24 hours in air; 24 hours at 140°F (60°C).

Drying shrinkage: 3.1 %.

Modulus of rupture, dry unfired: 175 psi.

Firing:

Time- 24 hours.
Temperature- 2225°F (1218°C).
Cone- 8

Total shrinkage: 10.4 %.

Absorption, 5-hour boiled: 0.6 %.

Absorption, 24-hour soaked: 0.6 %.

Saturation coefficient: 1.00

Apparent porosity: 1.4 %.

Bulk density: 2.41 g/cc.

Fired modulus of rupture: 4750 psi.

Mohs' hardness: 8

Color: Dark red-brown.

Comments Should be satisfactory for face brick or quarry tile. Low dry strength.

Crushing Characteristics (unfired material) -

Particle Size -20 mesh. Retention Time 15 min. draw trials (following 3-4 hr. to 1800°F, 982°C).

Chemical & Mineralogical Data: Not determined.

Chemical Analysis		Mineralogy	
Oxide	Weight %	Mineral	volume %
SiO_2			
TiO_2		Quartz	
Al_2O_3		Feldspar	
Fe_2O_3		Carbonate	
FeO		Mica	
MnO		Chlorite-vermiculite	
MgO		Montmorillonite	
CaO		Others	
Na_2O			
K_2O			
P_2O_5			
S (total)		Total	
C (org.)			
CO_2			
H_2O^-			
H_2O^+			
Ignition loss			
Total			

Analyst _____ _____

Date _____ _____

Method _____ _____

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. -. Lat. _____, Long. _____.

Field No. 139., Collected by J.W. Smith ? Date c. 1966.

Sample Method Grab (?). Weathering/alteration -

Structural Attitude -

Stratigraphic Assignment -

Sample Description & Comments No further data available.

Compiled by B. J. O'Connor Date 5-1-84

CERAMIC TESTS AND ANALYSES

Material Clay/shale? Compilation Map Location No. F1.67-4

County Floyd. Sample Number 141.

Raw Properties: Lab & No. USBM, Tuscaloosa, Ala.; No. G-9-4.

Date Reported 1-11-67. Ceramist M. E. Tyrell, USBM.

Water of Plasticity 21.0 % Working Properties Low plasticity.
pH = 4.4 Not effervescent with HCl.

Color Yellow. Drying Shrinkage 2.5 % Dry Strength Low.

Remarks No drying defects.

Slow Firing Tests:

Temp. °F (°C)	Color	Hardness (Mohs')	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data: Bulk Dens. gm/cc
1800 (982)	Tan	2	2.5	23.1	37.4	1.62
1900 (1038)	Tan	3	5.0	17.4	31.0	1.78
2000 (1093)	Light brown	4	5.0	16.6	29.9	1.80
2100 (1149)	Light brown	5	7.5	15.9	29.4	1.85
2200 (1204)	Red-brown	6	7.5	13.7	25.6	1.87
2300 (1260)	Dark brown	7	10.0	7.9	15.8	2.00

Remarks / Other Tests Should fire to "MW" face brick specifications at about 2250°F (1232°C). Poor color. Potential Use: Building brick. ("SW" face brick - see Extrusion Test data.)

Preliminary Bloating (Quick Firing) Tests: Negative.

TUSCALOOSA METALLURGY RESEARCH LABORATORY

Clay Evaluation: Extrusion Tests

Sender's identification: 141 (Floyd Co.)

Date 9/28/67 (+ Firing Tests 1-12-67)

Tuscaloosa number: G-9-4

Body composition:

Raw clay through 6 mesh: 100 %.

Tempering water: 19.0% of dry batch weight.

Vacuum on machine: 27 inches of mercury.

Drying: 24 hours in air; 24 hours at 140°F (60°C).

Drying shrinkage: 2.1 %.

Modulus of rupture, dry unfired: 320 psi.

Firing:

Time- 24 hours.
Temperature- 2225°F (1218°C).
Cone- 8

Total shrinkage: 7.3 %.

Absorption, 5-hour boiled: 7.8 %.

Absorption, 24-hour soaked: 6.4 %.

Saturation coefficient: 0.82

Apparent porosity: 16.4 %.

Bulk density: 2.10 g/cc.

Fired modulus of rupture: 1830 psi.

Mohs' hardness: 6

Color: Red-brown.

Comments Should be satisfactory for "SW" class face brick.

Crushing Characteristics (unfired material) -

Particle Size -20 mesh. Retention Time 15 min. draw trials (following 3-4 hr. to 1800°F, 982°C).

Chemical & Mineralogical Data: Not determined.

Chemical Analysis		Mineralogy	
Oxide	Weight %	Mineral	volume %
SiO_2			
TiO_2		Quartz	
Al_2O_3		Feldspar	
Fe_2O_3		Carbonate	
FeO		Mica	
MnO		Chlorite-vermiculite	
MgO		Montmorillonite	
CaO		Others	
Na_2O			
K_2O			
P_2O_5			
S (total)		Total	
C (org.)			
CO_2			
H_2O^-			
H_2O^+			
Ignition loss			
Total			

Analyst _____ _____

Date _____ _____

Method _____ _____

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. -. Lat. _____, Long. _____.

Field No. 141., Collected by J.W. Smith ? Date c. 1966.

Sample Method Grab (?). Weathering/alteration -

Structural Attitude -

Stratigraphic Assignment -

Sample Description & Comments No further data available.

Compiled by B. J. O'Connor Date 5-1-84

CERAMIC TESTS AND ANALYSES

Material Clay/shale? Compilation Map Location No. Fl.67-5

County Floyd. Sample Number 144.

Raw Properties: Lab & No. USBM, Tuscaloosa, Ala.; No. G-9-7.

Date Reported 1-11-67. Ceramist M. E. Tyrrell, USBM.

Water of Plasticity 24.3 % Working Properties Low plasticity.
pH = 5.0. Not effervescent with HCl.

Color Tan. Drying Shrinkage 2.5 % Dry Strength Low.

Remarks No drying defects.

Slow Firing Tests:

Temp. °F (°C)	Color	Hardness (Mohs')	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data: Bulk Dens. gm/cc
1800 (982)	Tan	3	2.5	20.5	34.4	1.68
1900 (1038)	Tan	3	5.0	20.3	34.9	1.72
2000 (1093)	Tan	4	7.5	13.5	26.2	1.94
2100 (1149)	Light brown	5	10.0	8.0	17.0	2.13
2200 (1204)	Red-brown	6	10.0	4.3	9.6	2.23
2300 (1260)	Dark brown	7	12.5	2.6	5.5	2.10

Remarks / Other Tests Should fire to "SW" face brick specifications at about 2100°F (1149°C). Fair color. Potential Use: Building brick. ("SW" face brick - see Extrusion Test Data.)

Preliminary Bloating (Quick Firing) Tests: Negative.

TUSCALOOSA METALLURGY RESEARCH LABORATORY

Clay Evaluation: Extrusion Tests

Sender's identification: 144 (Floyd Co.)

Date 9/28/67 (+ Firing Tests 1-12-67)

Tuscaloosa number: G-9-7

Body composition:

Raw clay through 6 mesh: 100 %.

Tempering water: 22.0 % of dry batch weight.

Vacuum on machine: 28 inches of mercury.

Drying: 24 hours in air; 24 hours at 140°F (60°C).

Drying shrinkage: 1.0 %.

Modulus of rupture, dry unfired: 285 psi.

Firing:

Time- 24 hours.
Temperature- 2120°F (1160°C).
Cone- 4

Total shrinkage: 8.3 %.

Absorption, 5-hour boiled: 3.9 %.

Absorption, 24-hour soaked: 3.7 %.

Saturation coefficient: 0.95

Apparent porosity: 9.0 %.

Bulk density: 2.30 g/cc.

Fired modulus of rupture: 3290 psi.

Mohs' hardness: 6

Color: Light brown.

Comments Should be satisfactory for "SW" class face brick. Poor color.

Crushing Characteristics (unfired material) -

Particle Size -20 mesh. Retention Time 15 min. draw trials (following 3-4 hr. to 1800°F, 982°C).

Chemical & Mineralogical Data: Not determined.

Chemical Analysis		Mineralogy	
Oxide	Weight %	Mineral	volume %
SiO_2			
TiO_2		Quartz	
Al_2O_3		Feldspar	
Fe_2O_3		Carbonate	
FeO		Mica	
MnO		Chlorite-vermiculite	
MgO			
CaO		Montmorillonite	
Na_2O		Others	
K_2O			
P_2O_5			
S (total)		Total	
C (org.)			
CO_2			
H_2O^-			
H_2O^+			
Ignition loss			
Total			

Analyst _____ _____

Date _____ _____

Method _____ _____

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. -, Lat. _____, Long. _____.

Field No. 144., Collected by J.W. Smith ? Date c. 1966.

Sample Method Grab (?). Weathering/alteration -

Structural Attitude -

Stratigraphic Assignment -

Sample Description & Comments No further data available.

Compiled by B. J. O'Connor Date 5-1-84

CERAMIC TESTS AND ANALYSES

Material Shale (Floyd). Compilation Map Location No. Fl.76-1

County Floyd. Sample Number -

Raw Properties: Lab & No. USBM, Tuscaloosa, Ala.; No. G-21-1.

Date Reported 3-30-76. Ceramist K. J. Liles, USBM.

Water of Plasticity - % Working Properties -

Color - Drying Shrinkage - % Dry Strength -

Slow Firing Tests:

Temp. °F (°C)	Color	Hardness	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data:

No test data.

Remarks / Other Tests Does not appear to have potential value as a structural clay product.

Preliminary Bloating (Quick Firing) Tests: Negative.

Crushing Characteristics (unfired material) -

Particle Size -20 mesh. Retention Time 15 min. draw trials (following 3-4 hr. to 1800°F, 982°C).

Chemical & Mineralogical Data:

Chemical Analysis

Oxide		Weight %
SiO_2		27.82
TiO_2		-
Al_2O_3		1.37
Fe_2O_3		2.37
FeO		-
MnO		-
$MgCO_3$		8.30
$CaCO_3$		48.37
Na_2O		-
K_2O		-
P_2O_5		-
S	(total)	-
C	(org.)	-
CO_2		-
H_2O^-		-
H_2O^+		-
Isoluble		38.65
Total		-

Mineralogy Not determined.

Mineral	volume %
Quartz	
Feldspar	
Carbonate	
Mica	
Chlorite-vermiculite	
Montmorillonite	
Others	
Total	

Analyst Pembroke Lab., Fla. (via C.T. Williams, Florida Rock Industries, 1986).

Date Jan. 21, 1976

Method

Sample Location Data:

County Floyd. Land Lot , Sec. , Dist. .

7 1/2' topo quad. Rome North (SW. cntr.) Lat. , Long. .

Field No. -, Collected by B. J. Timmons (Fla. Rock). Date Feb. 1976.

Sample Method Grab (?) Weathering/alteration -

Structural Attitude -

Stratigraphic Assignment Floyd Shale (Mississippian).

Sample Description & Comments Shale sample from west side of limestone quarry operated by Florida Rock Industries (formerly owned by LBI Quarries, Inc.) and located 1 1/4 mi. W. of U.S. Hwy. 27 on the Berry School property, N. of Redman Rd., 3/4 mi. N. of Rome city limits. Shale is 30 ft. thick (ave.) and overlies the limestone on the west side of the quarry.

Compiled by B. J. O'Connor Date 3-10-86

CERAMIC TESTS AND ANALYSES

Material Shale (Floyd). Compilation Map Location No. Fl.77-1

County Floyd. Sample Number -

Raw Properties: Lab & No. USBM, Tuscaloosa, Ala.; No. GA-25-23.

Date Reported 5-12-77. Ceramist K. J. Liles, USBM.

Water of Plasticity 20.0 %Working Properties Short. pH = 5.2.
HCl effervescence: None

Color Gray. Drying Shrinkage 2.5 % Dry Strength Fair.

Slow Firing Tests:

Temp. °F (°C)	Color (Munsell)*	Hardness (Mohs')	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data: Bulk Dens. gm/cc
1832 (1000)	Moderate orange (5 YR 7/8)	3	5.0	16.0	30.0	1.87
1922 (1050)	Moderate orange (5 YR 6/8)	4	5.0	13.0	25.9	1.96
2012 (1100)	Brownish orange (2.5 YR 5/8)	5	7.5	12.5	24.5	1.99
2102 (1150)	Strong brown (2.5 YR 4/6)	6	10.0	6.2	13.2	2.11
2192 (1200)	Moderate reddish-brown (10 R 3/4)	7	10.0	4.4	9.2	2.12
2282 (1250)	-	-	Expanded	-	-	-

Remarks / Other Tests Potential Use: Structural clay products (e.g., building brick) at 1922-2182°F (1050°-1200°C).

Preliminary Bloating (Quick Firing) Tests: Not determined.

*Note: Munsell color names were taken from conversion charts in Kelly and Judd (1976, p. 18-20)

Crushing Characteristics (unfired material) -

Particle Size -20 mesh. Retention Time 1 hour (following 24 hours to temperature).

Chemical & Mineralogical Data: Not determined.

Chemical Analysis		Mineralogy	
Oxide	Weight %	Mineral	volume %
SiO_2			
TiO_2		Quartz	
Al_2O_3		Feldspar	
Fe_2O_3		Carbonate	
FeO		Mica	
MnO		Chlorite-vermiculite	
MgO		Montmorillonite	
CaO		Others	
Na_2O			
K_2O			
P_2O_5			
S (total)		Total	
C (org.)			
CO_2			
H_2O^-			
H_2O^+			
Ignition loss			
Total			

Analyst _____ _____

Date _____ _____

Method _____ _____

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. Rock Mountain (E. cntr.). Lat. _____, Long. _____.

Field No. -, Collected by R. Dickerson (DOT). Date c. April 1977.

Sample Method Grab (?) Weathering/alteration -

Structural Attitude -

Stratigraphic Assignment Floyd Shale (Mississippian).

Sample Description & Comments Typical Floyd Shale from stockpile of Bickerstaff Clay Products Co., Inc. from their Neill pit about 3 1/2 mi. W.-NW. of Rome on the S. side of the Central of Ga. RR. and Huffaker Rd., W. of Woods Rd. (Also see Fl.80-2.)

Compiled by B. J. O'Connor Date 5-22-84

CERAMIC TESTS AND ANALYSES

Material Shale (Floyd). Compilation Map Location No. Fl.80-1

County Floyd. Sample Number Clay No. 3.

Raw Properties: Lab & No. Marazzi Ceramiche, #M.P. 1792.

Date Reported March 1980. Ceramist L. Lorici.

Water of Plasticity - % Working Properties Good workability; compact.

Color Buff-brown. Drying Good. % Dry Strength -
Pressing Good. Fluidizing Good.
Slow Firing Tests: (50 x 100 x 8 mm. pressed tiles.)

Temp. °F (°C)	Color	Hardness	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data:
1976 (1080) (= cycle 1)	-	-	-	-	-	-
2030 (1110) (= cycle 2)	-	-	3.3	-	6.0	-
1994 (1090) (= cycle 3)	-	-	5.3	-	2.3	-

Remarks / Other Tests Argillaceous, illitic clay (low percentage of kaolinite) with satisfactory firing characteristics. ("A": clay with interesting technological features for making tile; further sampling is necessary.) (DTA and Dilatometric Analyses on file. - unpubl. report.)

Preliminary Bloating (Quick Firing) Tests: Not determined.

locn. no. Fl.80-1, cont.

Crushing Characteristics (unfired material) -

Particle Size < 40 microns Retention Time Cycle 1: 40-45 min.
Cycle 2: 70-75 min. in roller kiln.
Cycle 3: 200-230 min.

Chemical & Mineralogical Data:

Chemical Analysis

Oxide	(A) Weight %	(B)
SiO_2	68.76	70.7
TiO_2	0.30	0.9
Al_2O_3	18.14	20.5
Fe_2O_3	4.0	2.3
FeO	-	-
MnO	0.00	-
MgO	0.76	0.9
CaO	0.00	-
Na_2O	0.19	0.3
K_2O	2.89	3.4
P_2O_5	-	-
S (total)	-	-
C (org.)	-	-
CO_2	-	-
H_2O^-	-	-
H_2O^+	-	-
Ignition loss	4.76	(5.4)
Total	99.80	99.0

Mineralogy

Mineral	volume % (A)	(B)
Quartz		x
Feldspar		
Carbonate		
Mica (Muscovite)		X
Chlorite (+ kaolinite)	(8)	
vermiculite		
Montmorillonite		
Illite	(92)	X
Kaolinite (disordered)		v. low
Total	-	-

x = present.
(A) = clays and micas only.

Analyst A) R. Landrum, Ga. Geol. Survey. M. A. Tadkod, Ga. Geol. Survey.
B) Marazzi Ceramiche. M. Ceramiche.

Date Aug. and Sept. 1979. Aug. and Sept. 1979.
Method A) Atomic Absorption.
B) XRF and Spectrophotometry (on fired material). X-ray diffraction.

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. Rock Mountain (E. cntr.). Lat. _____, Long. _____.

Field No. 3, Collected by M. A. Tadkod. Date July 1979.

Sample Method Grab. Weathering/alteration Weathered.

Structural Attitude -

Stratigraphic Assignment Floyd Shale ? (Mississippian).

Sample Description & Comments Sample from pit about 2 1/2 mi. W.-NW. of Rome (Tadkod, 1979 and 1980, unpubl. data, Ga. Geol. Survey files).

Compiled by B. J. O'Connor Date 3-10-86

CERAMIC TESTS AND ANALYSES

Material Shale (Floyd). Compilation Map Location No. Fl.80-2

County Floyd. Sample Number Clay No. 4.

Raw Properties: Lab & No. Marazzi Ceramiche, #M.P. 1793.

Date Reported March 1980. Ceramist L. Lorici.

Water of Plasticity - % Working Properties -

Color Brown-buff. Drying Good. Dry Strength -
Pressing Good. Fluidizing Good.

Slow Firing Tests: (50 x 100 x 8 mm. pressed tiles.)

Temp. °F (°C)	Color	Hardness	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data:
1976 (1080) (=cycle 1)	-	-	-	-	-	-
2030 (1110) (=cycle 2)	-	-	4.0	-	10.0	-
1994 (1090) (=cycle 3)	-	-	6.1	-	6.5	-

Remarks / Other Tests Illitic, micaceous material with low percentage clay mineral content. ("Bl": too refractory for making tiles.) Used in blends by Bickerstaff Clay Products. Co. for making brick. (DTA and Dilatometric Analyses on file - unpublished report.)

Preliminary Bloating (Quick Firing) Tests: Not determined.

Crushing Characteristics (unfired material) -

Particle Size < 40 microns Retention Time Cycle 1: 40-45 min.
Cycle 2: 70-75 min. in roller kiln.
Chemical & Mineralogical Data: Cycle 3: 200-230 min.

Chemical Analysis

Oxide	(A) Weight %	(B)
SiO_2	69.34	64.9
TiO_2	0.43	1.1
Al_2O_3	18.72	19.9
Fe_2O_3	4.20	10.5
FeO	-	-
MnO	0.00	-
MgO	0.53	0.6
CaO	0.11	-
Na_2O	0.17	0.2
K_2O	1.38	2.0
P_2O_5	-	-
S (total)	-	-
C (org.)	-	-
CO_2	-	-
H_2O^-	-	-
H_2O^+	-	-
Ignition loss	4.97	(6.6)
Total	99.85	99.2

Mineralogy

Mineral	volume % (A)	(B)
Quartz		x
Feldspar		
Carbonate		
Mica		low
Chlorite (+ kaolinite) vermiculite	(35)	
Montmorillonite		
Illite	(65)	
Kaolinite		low
Total	-	-

x = present.
(A) = clays and micas only.

Analyst A) R. Landrum, Ga. Geol. Survey. M. A. Tadkod, Ga. Geol. Survey.
B) Marazzi Ceramiche. M. Ceramiche.

Date Aug. and Sept. 1979. Aug. and Sept. 1979.
Method A) Atomic Absorption.
B) XRF and Spectrophotometry (on fired material). X-ray diffraction.

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. Rock Mountain (E. cntr.). Lat._____, Long. _____.

Field No. 4, Collected by M. A. Tadkod. Date July 1979.

Sample Method Grab. Weathering/alteration Weathered.

Structural Attitude -

Stratigraphic Assignment Floyd Shale (Mississippian).

Sample Description & Comments Sample from pit of Bickerstaff Clay Products Co., Inc. about 3 1/2 mi. W.-NW. of Rome (Tadkod, 1979 and 1980, unpbl. data, Ga. Geol. Survey files) on the N. side of the Central of GA. RR. and S. of Huffaker Rd., W. of Woods Rd. (Also see F1.77-1.)

Compiled by B. J. O'Connor Date 8-13-86

CERAMIC TESTS AND ANALYSES

Material Shale (Conasauga). Compilation Map Location No. Fl.80-3

County Floyd. Sample Number Clay No. 5.

Raw Properties: Lab & No. Marazzi Ceramiche, #M.P. 1794.

Date Reported March 1980. Ceramist L. Lorici.

Water of Plasticity - % Working Properties Compact.

Color Reddish brown. Drying Good. Dry Strength -
Pressing Good. Fluidizing Good.

Slow Firing Tests: (50 x 100 x 8 mm. pressed tiles.)

Temp. °F (°C)	Color	Hardness	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data:
1976 (1080) (=cycle 1)	-	-	-	-	-	-
2030 (1110) (=cycle 2)	-	-	3.8	-	7.0	-
1994 (1090) (=cycle 3)	-	-	5.5	-	3.4	-

Remarks / Other Tests Illitic, micaceous clay with low percentage of kaolinite. ("B1": too refractory for making tile.) (DTA & Dilatometric Analyses on file - unpublished report.)

Preliminary Bloating (Quick Firing) Tests: Not determined.

Crushing Characteristics (unfired material) -

Particle Size < 40 microns Retention Time Cycle 1: 40-45 min.
Cycle 2: 70-75 min. in roller kiln.
Cycle 3: 200-230 min.

Chemical & Mineralogical Data:

Chemical Analysis

Oxide	(A)	Weight % (B)
SiO_2	59.72	65.2
TiO_2	0.43	0.9
Al_2O_3	21.74	22.0
Fe_2O_3	7.24	6.9
FeO	-	-
MnO	0.00	-
MgO	0.90	0.5
CaO	0.22	-
Na_2O	0.17	0.2
K_2O	2.80	2.8
P_2O_5	-	-
S (total)	-	-
C (org.)	-	-
CO_2	-	-
H_2O^-	-	-
H_2O^+	-	-
Ignition loss	6.62	(6.1)
Total	99.84	98.5

Mineralogy

Mineral	volume % (A)	(B)
Quartz		x
Feldspar		
Carbonate		
Mica		X
Chlorite (+ kaolinite)	X	
vermiculite		
Montmorillonite		
Illite	X	X
Kaolinite (disordered)		V. low
Total	-	-

x = present.
(A) = clays and micas only.

Analyst A) R. Landrum, Ga. Geol. Survey. M. A. Tadkod, Ga. Geol. Survey.
B) Marazzi Ceramiche. M. Ceramiche.

Date Aug. and Sept. 1979. Aug. and Sept. 1979.
Method A) Atomic Absorption.
B) XRF and Spectrophotometry (on fired material). X-ray diffraction.

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. Livingston (NW. cntr.). Lat. _____, Long. _____.

Field No. 5, Collected by M. A.Tadkod. Date July 1979.

Sample Method Grab. Weathering/alteration Weathered.

Structural Attitude -

Stratigraphic Assignment Conasauga Group (Cambrian) shale.

Sample Description & Comments Sample from roadcut about 1/2 mi. from Livingston (Tadkod, 1979 and 1980, unpubl. data, Ga. Geol. Survey files. Notes state 1/2 mi. E. but map shows W. of Livingston).

Compiled by B. J. O'Connor Date 3-10-86

CERAMIC TESTS AND ANALYSES

Material Shale (Floyd). Compilation Map Location No. Fl.80-4a

County Floyd. Sample Number Floyd Top Shale

Raw Properties: Lab & No. Georgia Tech., #F.

Date Reported 12-10-80. Ceramist J. F. Benzel,Georgia Tech.

Water of Plasticity - % Working Properties -

Color - Drying Shrinkage 5.26 to 5.82% Dry Strength (MOR) 346 psi.

Remarks Drying Wt. loss = 26.19%.

Slow Firing Tests:(1 x 1 x approximately 9 in. extruded bars.)

Temp. °F (°C)	Color	Hardness (MOR, psi.)	Linear Shrinkage, % (total)	Absorption %	Appr. Por. %	Other data: Loss on Ignition
Cone 03: 2039 (1115)	-	2574	4.03 (9.40)	10.64	-	6.90
Cone 02: 2057 (1125)	-	3010	5.79 (11.05)	6.28	-	7.06
Cone 1: 2120 (1160)	-	2892	5.82 (11.64)	5.86	-	6.89

Remarks / Other Tests This shale was used in blends (with approximately equal amounts of Alabama shale and Cordova, Ala., fire clay) to make 8" sewer pipe by Griffin Pipe Products Co. (at their Milledgeville plant). (For tests with other blends see Fl.80-4c to d; Plk. 80-2c ; and Wkr. 80-2b and 3b.)

Preliminary Bloating (Quick Firing) Tests: Not determined.

CERAMIC TESTS AND ANALYSES

Material Shale (Floyd). Compilation Map Location No. Fl.80-4b

County Floyd. Sample Number Floyd Bottom Shale.

Raw Properties: Lab & No. Georgia Tech., #FB

Date Reported 12-10-80. Ceramist J. F. Benzel, Georgia Tech.

Water of Plasticity - % Working Properties -

Color - Drying Shrinkage 4.41 to 4.44% Dry Strength (MOR) 447 psi.

Remarks Drying Wt. loss = 21.96%.

Slow Firing Tests:(1 x 1 x approximately 9 in. extruded bars.)

Temp. °F (°C)	Color	Hardness (MOR, psi.)	Linear Shrinkage, % (total)	Absorption %	Appr. Por. %	Other data: Loss on Ignition
Cone 03: 2039 (1115)	-	3550	4.18 (8.59)	6.99	-	6.61
Cone 2: 2057 (1125)	-	3561	5.22 (9.66)	5.11	-	7.35
Cone 1: 2120 (1160)	-	3228	6.01 (10.45)	4.75	-	7.33

Remarks / Other Tests Underlies the "Floyd Top Shale" (see Fl. 80-4a) which was used to make sewer pipe (in blends with other clays) by Griffin Pipe Products Co. (Also see Fl.80-4d blend.)

Preliminary Bloating (Quick Firing) Tests: Not determined.

CERAMIC TESTS AND ANALYSES

Material Shale and clay (blend). Compilation Map Location No. F1.80-4c

County Floyd, Ga. (and Ala.). Sample Number 8" pipe mix.

Raw Properties: Lab & No. Georgia Tech., #S.

Date Reported 12-10-80. Ceramist J. F. Benzel, Georgia Tech.

Water of Plasticity - % Working Properties -

Color - Drying Shrinkage 3.58 % Dry Strength (MOR) 260 psi.

Remarks Drying Wt. loss = 18.78%.

Slow Firing Tests: (1 x 1 x approximately 9 in. extruded bars.)

Temp. °F (°C)	Color	Hardness (MOR, psi.)	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data: Loss on Ignition
Cone 03: 2039 (1115)	-	2209	4.01 (7.59)	8.25	-	6.39
Cone 02: 2057 (1125)	-	2785	5.35 (8.93)	5.32	-	6.26
Cone 1: 2120 (1160)	-	2537-2984	5.29-5.61 (8.85-9.19)	5.08-5.39	-	4.94-6.71

Remarks / Other Tests Production blend of 35% "Floyd Top Shale" (F1.80-4a) plus 35% Alabama shale and 30% fire clay (+ 8% grog) used by Griffin Pipe Products Co. in making 8" sewer pipe.

Preliminary Bloating (Quick Firing) Tests: Not determined.

CERAMIC TESTS AND ANALYSES

Material Shale and clay (blend). Compilation Map Location No. Fl.80-4d

County Floyd, Ga. (and Ala.) Sample Number 8" pipe mix.

Raw Properties: Lab & No. Georgia Tech., #G.

Date Reported 12-10-80. Ceramist J. F. Benzel, Georgia Tech.

Water of Plasticity - % Working Properties -

Color - Drying Shrinkage 2.94-3.00% Dry Strength (MOR) 226 psi.

Slow Firing Tests: (1 1/2 x 1 1/2 x approximately 9 in. extruded bars.)

Temp. °F (°C)	Color	Hardness (MOR, psi.)	Linear Shrinkage, % (total)	Absorption %	Appr. Por. %	Other data: Loss on Ignition
Cone 03: 2039 (1115)	-	2091	4.08 (7.06)	7.95	-	6.49
Cone 02: 2057 (1125)	-	2587	5.39 (8.33)	5.83	-	5.85
Cone 1: 2120 (1160)	-	2263-2790	5.55-5.78 (8.55-8.77)	4.19-4.82	-	7.65-7.99

Remarks / Other Tests Blend of 35% "Floyd Top Shale" (Fl. 80-4a) plus 35% Alabama shale and 30% fire clay (+ 8% grog) used by Griffin Pipe Products Co. in making 8" sewer pipe. (Note: This is the same blend as used in Fl.80-4d and differs only in being formed into larger test bars.

Preliminary Bloating (Quick Firing) Tests: Not determined.

CERAMIC TESTS AND ANALYSES

Material Shale (blend). Compilation Map Location No. F1.80-4e

County Floyd (and Hancock). Sample Number -

Raw Properties: Lab & No. Georgia Tech., #X5.

Date Reported 12-10-80. Ceramist J. F.Benzel, Georgia Tech.

Water of Plasticity - % Working Properties -

Color - Drying Shrinkage 4.05-4.72% Dry Strength (MOR) 637 psi.

Remarks Drying Wt. loss = 20.75%.

Slow Firing Tests: (1 x 1 x approximately 9 in. extruded bars.)

Temp. °F (°C)	Color	Hardness (MOR, psi.)	Linear Shrinkage, % (total)	Absorption %	Appr. Por. %	Other data: Loss on Ignition
Cone 03: 2039 (1115)	-	-	-	-	-	-
Cone 02: 2057 (1125)	-	2847	4.72 (9.44)	4.48	-	5.89
Cone 1: 2120 (1160)	-	2511-3503	5.29-5.60 (9.34-9.65)	4.68-5.74	-	5.33-7.31

Remarks / Other Tests Test blend of 35% "Floyd Top Shale" (F1.80-4a), 30% "Floyd Bottom Shale" (F1.80-4b) and 35% Linton shale (Hancock Co., Ga.). Probably suitable for making sewer pipe.

Preliminary Bloating (Quick Firing) Tests: Not determined.

Crushing Characteristics (unfired material) -

Particle Size - Retention Time -

Chemical & Mineralogical Data: Not determined.

Chemical Analysis		Mineralogy	
Oxide	Weight %	Mineral	volume %
SiO_2			
TiO_2		Quartz	
Al_2O_3		Feldspar	
Fe_2O_3		Carbonate	
FeO		Mica	
MnO		Chlorite-vermiculite	
MgO		Montmorillonite	
CaO		Others	
Na_2O			
K_2O			
P_2O_5			
S (total)		Total	
C (org.)			
CO_2			
H_2O^-			
H_2O^+			
Ignition loss			
Total			

Analyst _____ _____

Date _____ _____

Method _____ _____

Sample Location Data:

County Floyd. Land Lot _____, Sec. _____, Dist. _____.

7 1/2' topo quad. Rock Mountain (cntr.). Lat. _____, Long. _____.

Field No. -, Collected by J. F. Benzel. Date Aug. 1980.

Sample Method Random grab samples. Weathering/alteration Moderately to very weathered.

Structural Attitude Bedding strikes N.80°E., dips 32°S.

Stratigraphic Assignment Floyd Shale (Mississippian).

Sample Description & Comments Samples of typical shales from Griffin Pipe Products Co. pit on S. side of Huffaker Rd., about 4 mi. W. of Rome. The "Floyd Bottom Shale" (b) appears to largely be a less weathered variety of the "Floyd Top Shale" (a).

Compiled by B. J. O'Connor Date 11-29-82

CERAMIC TESTS AND ANALYSES

Material Shale (Conasauga). Compilation Map Location No. F1.82-1a

County Floyd. Sample Number Floyd Co.-A

Raw Properties: Lab & No. USBM, Tuscaloosa, Ala.; No. GA-30-1.

Date Reported 4-14-82. Ceramist K. J. Liles, USBM.

Water of Plasticity 20.1 % Working Properties Plastic. pH = 5.2. Not effervescent with HCl.

Color Tan. Drying Shrinkage 5.0 % Dry Strength Good.

Slow Firing Tests:

Temp. °F (°C)	Color (Munsell)*	Hardness (Mohs')	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data: Bulk Dens. gm/cc
1832 (1000)	Moderate orange (5 YR 6/8)	2	5.0	21/2	36.7	1.73
1922 (1050)	Moderate orange (5 YR 6/8)	3	5.0	18.4	22.2	1.81
2012 (1100)	Brownish orange (2.5 YR 5/8)	3	5.0	14.5	28.1	1.93
2102 (1150)	Strong brown (2.5 YR 4/6)	4	7.5	11.6	23.4	2.02
2192 (1200)	Moderate reddish-brown (2.5 YR 4/4)	5	10/0	7.9	17.1	2.16
2282 (1250)	Moderate reddish-brown (2.5 YR 3/4)	5	10.0	5.8	12.9	2.22

Remarks / Other Tests Potential Use: Structural clay products (e.g. building brick at 2102-2282°F, 1150-1250°C).

Preliminary Bloating (Quick Firing) Tests: Negative.

*Note: Munsell color names were taken from conversion charts in Kelly and Judd (1976, p. 19-20).

CERAMIC TESTS AND ANALYSES

Material Shale (Conasauga). Compilation Map Location No. Fl.82-1b

County Floyd. Sample Number Floyd Co. -B

Raw Properties: Lab & No. USBM, Tuscaloosa, Ala.; GA-30-2.

Date Reported 4-14-82. Ceramist K. J. Liles, USBM.

Water of Plasticity 21.0 %Working Properties Plastic. pH = 5.0. Not effervescent with HCl.

Color Tan. Drying Shrinkage 5.0 % Dry Strength Good.

Slow Firing Tests:

Temp. °F (°C)	Color (Munsell)*	Hardness (Mohs')	Linear Shrinkage, %	Absorption %	Appr. Por. %	Other data: Bulk Dens. gm/cc
1832 (1000)	Moderate orange (5 YR 6/8)	2	5.0	22.7	38.5	1.69
1922 (1050)	Moderate orange (5 YR 6/8)	3	5.0	19.8	35.1	1.77
2012 (1100)	Brownish orange (2.5 YR 5/8)	3	5.0	16.2	30.4	1.87
2102 (1150)	Strong brown (2.5 YR 4/8)	4	5.0	13.5	26.5	1.97
2192 (1200)	Moderate reddish-brown (2.5 YR 4/4)	5	7.5	10.0	21.0	2.09
2282 (1250)	Moderate reddish-brown (2.5 YR 3/4)	5	10.0	7.4	16.2	2.18

Remarks / Other Tests Potential Use: Structural clay products (e.g. building brick at 2102-2282°F, 1150-1250°C.)

Preliminary Bloating (Quick Firing) Tests: Negative.

*Note: Munsell color names were taken from conversion charts in Kelly and Judd (1976, p. 19-20).

Crushing Characteristics (unfired material) -

Particle Size -20 mesh. Retention Time 1 hour (following 24 hours to temperature).

Chemical & Mineralogical Data:

Chemical Analysis (SRB-Floyd-1A)

Oxide	Weight %
SiO_2	58.80
TiO_2	0.70
Al_2O_3	22.80
Fe_2O_3(total)	6.80
FeO	-
MnO	0.10
MgO	1.80
CaO	0.10
Na_2O	0.70
K_2O	2.90
P_2O_5	0.05
S (total)	-
C (org.)	-
CO_2	-
H_2O^-	-
H_2O^+	-
Ignition loss	5.18
Total	99.93

Mineralogy: Not determined.

Mineral	volume %
Quartz	
Feldspar	
Carbonate	
Mica	
Chlorite-vermiculite	
Montmorillonite	
Others	
Total	

Analyst J. R. Landrum, Ga. Geol. Survey.

Date Nov. 1980. (Lab. No. 81-24)

Method Atomic Absorption.

Sample Location Data:

County Floyd. Land Lot. 90, 91, and 126 Sec. _____, Dist. 3 .

7 1/2' topo quad. Livingston (E. cntr.) Lat. _____, Long. _____.

Field No. Lvstn. 81-2 A & B , Collected by B. J. O'Connor Date 9-22-81.

Sample Method Numerous grab samples. Weathering/alteration Somewhat weathered.

Structural Attitude Crumpled - beds strike NE.

Stratigraphic Assignment Conasauga Group (Cambrian).

Sample Description & Comments Sample of a uniform tan-brown, hard shale strongly deformed by small scale, tight folds (also contains local hard, silty, concretionary? layers up to 1 inch thick). Taken from exposure in bed of NW.-trending farm road (A =upper, B = lower half of outcrop). Located on the J. D. Lanier property about 8 miles SW. of Rome, 1 1/2 miles S. of Coosa River, 1/2 mile S. of Blacks Bluff Rd., about 1/4 mile W. of Flat Rock Rd. and just E. of Webb Creek. Chemical analysis determined on similar material collected by S. R. Brockinton (9-16-80).

Compiled by B. J. O'Connor Date 5-22-84

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C4-62 (Reapproved 1970) Standard specification for clay drain tile, Part 16, p. 1-7.

C13-69 (Replaced by C700-74) Specifications for standard strength clay sewer pipe, Part 16, p. 409-413.

C24-72 Pyrometric cone equivalent (PCE) of refractory materials, Part 17, p. 9-14.

C27-70 Classification of fireclay and high-alumina refractory brick, Part 17, p. 15-17.

C43-70 Standard definitions of terms relating to structural clay products, Part 16, p. 33-35.

C62-69 Standard specification for building brick (solid masonry units made from clay or shale), Part 16, p. 121-125.

C216-71 Standard specification for facing brick (solid masonry units made from clay or shale), Part 16, p. 121-125.

C410-60 (Reapproved 1972) Standard specification for industrial floor brick, Part 115, p. 217-218.

C479-72 Standard specification for vitrified clay liner plates, Part 16, p. 283-284.

C330-69 Specification for lightweight aggregates for structural concrete, Part 14, p. 229-232.

C315-56 (Reapproved 1972) Standard specification for clay flue linings, Part 16, p. 169-171.

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CLAY AND SHALE TEST LOCATIONS IN FLOYD COUNTY

Georgia Geologic Survey
Information Circular 68
Plate 1

EXPLANATION

Numbers correspond to the "Map Location No." in text

Exact sample location

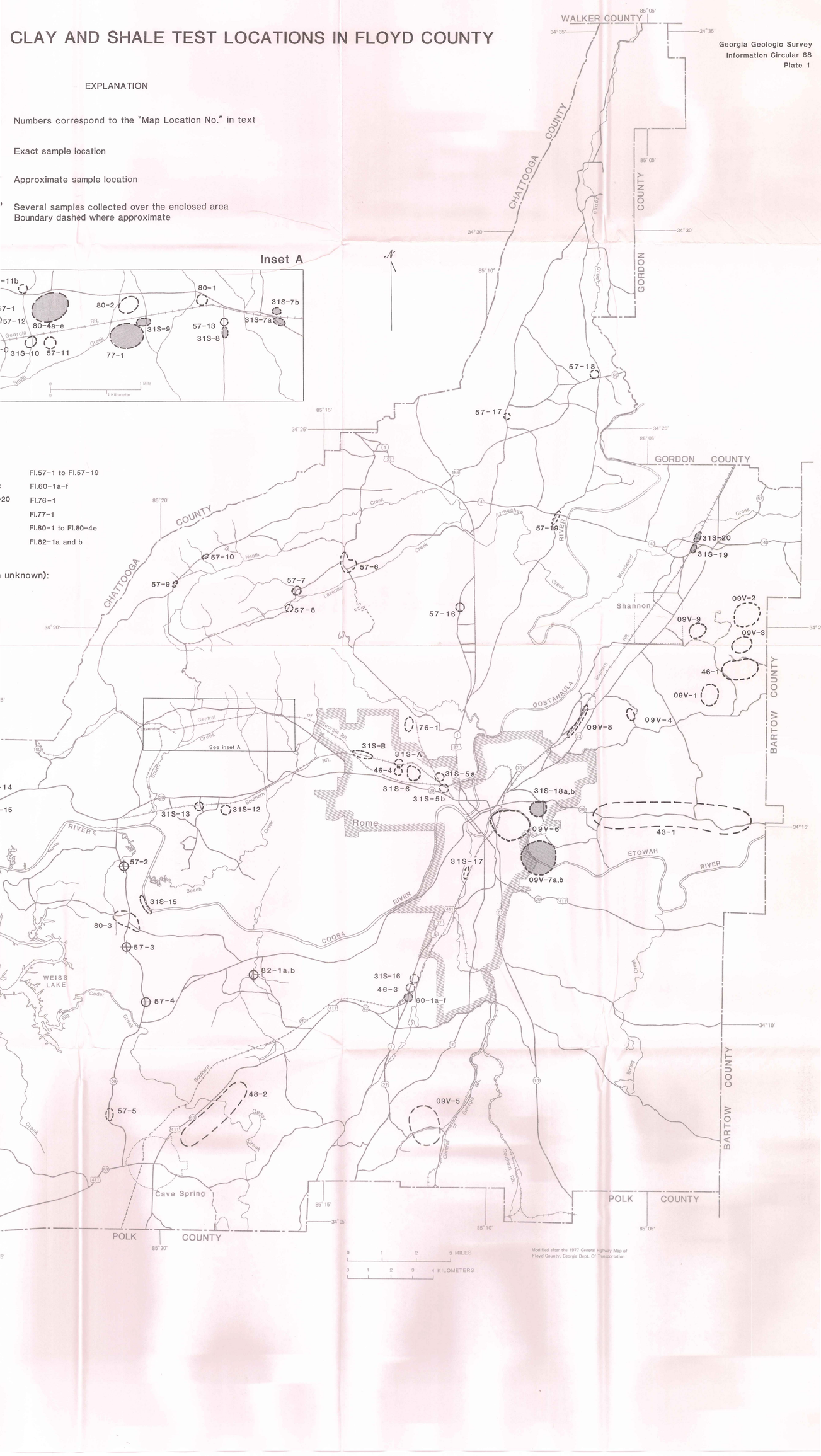
Approximate sample location

Several samples collected over the enclosed area
Boundary dashed where approximate

Inset A

Fl.57-1 to Fl.57-19
Fl.60-1a-f
Fl.76-1
Fl.77-1
Fl.80-1 to Fl.80-4e
Fl.82-1a and b

unknown):



Modified after the 1977 General Highway Map of Floyd County, Georgia Dept. Of Transportation